

SERVICE
MANUAL 2220

marantz

model 2220

Stereophonic Receiver

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INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 2220 Stereophonic Receiver.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instruction should be read carefully. No attempt should be made to proceed without a good understanding of the operation in the receiver.

The part lists furnish information by which replacement part may be ordered from the Marantz Company. A simple description is included for parts which can be usually be obtained through local suppliers.

1. Service Notes

As can be seen from the circuit diagram, the chassis of Model 2220 consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. FM Front End & AM Tuner mounted on P.C. Board, P100
2. FM IF Amplifier, Detector, Muting Control
and Meter Amplifier Unit mounted on P.C. Board, P200
3. MPX Stereo Decoding Amplifier mounted on P.C. Board, P300
4. Phono Amplifier mounted on P.C. Board, P900
5. Tone Amplifier mounted on P.C. Board, P500
6. Tone Control Volume Unit mounted on P.C. Board, P650
7. Power Amplifier mounted on P.C. Board, P700
8. Power Supply mounted on P.C. Board, P800
9. Loudness, Muting, High and Low Filter Switch Unit mounted on P.C. Board, P600

2. AM Tuner

All components except Tuning capacitor and ferrite bar antenna are mounted on a printed circuit board P100.

The AM signals induced in a ferrite bar antenna are applied to the base of Mixer transistor H102 through a capacitor of C109, while the local oscillator voltage is injected to the emitter of H102 through the capacitor C110. Both AM signals and oscillating voltage are mixed at the base-emitter junction and converted into 455KHz intermediate frequency. The resulting IF signal is applied to the first IF transformer L102 consisting of one ceramic filter and two tuned circuits.

The output of L102 is led to the transistor H103 which in turn apply its output to the transistor of next stage H104. The fully amplified IF output is then applied to the diode H108 to detect audible signal through the detector transformer L103. The detected audio signal is filtered and amplified and the final audio output is obtained from the collector of H105 and applied one to the tape out jacks through monitor switch on the front panel and the other to the function rotary switch.

The DC component of the detected IF signal is used as a AGC voltage to control emitter current of H103 and H102 through the resistors R113 and R106 respectively. A part of IF signal output is also applied to the diode H109 through a capacitor C125 and rectified to obtain DC current for energizing the AM signal strength meter M001.

3. FM Tuner

The FM Tuner section of Model 2220 is divided into three functional blocks: FM front end, IF amplifier & Detector, Muting control and MPX stereo decoding circuit.

FM signals induced on a FM antenna are led to FM antenna coil L106. These signals are then applied to the FET RF amplifier which in turn applies its output to the next Transistor Mixer H112 through a high-Q tuned circuit. The Mixer convert its input signal into 10.7MHz intermediate frequency and amplifies it. The H111 is a local oscillator and its output is injected

into the base of Mixer transistor, the injection voltage is about 50mV. The 10.7MHz front end IF output is led to the next IF amplifier unit through a coaxial cable.

The IF amplifier unit consists of five stages of IF amplifiers. Two pieces of ceramic filters are used to obtain high selectivity a pair of symmetrical diode limiter is also employed for the best limiting characteristics, improved capture ratio and good AM suppression.

A part of IF amplifier H202 is rectified by the diodes H210 and H211 and its DC output is fed back to the gate of FET RF amplifier to decrease the gain of it with increased input signal strength.

3-1 Muting and Auto-Stereo Switching Circuits

The muting circuit consisting of all solid-state electrical switching has been incorporated in the Model 2220.

The DC voltage obtained by rectifying a part of IF output signal from the H204 is applied to the base of H207 and turns on it if the IF output is greater than predetermined level (muting threshold level). When the H207 is turned on, the H208 is turned off, thus allowing the emitter-collector resistance of the H208 increasing and the collector voltage rises about 8V. The increased collector voltage increases the base bias voltage and makes the switching transistor H209 turn on, thus decreasing the collector-emitter resistance to near zero ohm and allowing the power supply path to the H205 closed.

When the input signal is lower than the predetermined level, the DC output obtained is small and can not turn on the H207, thus the H207 keeps its turn-off state and this makes H208 turn on, decreasing the collector voltage and turning off H209. Thus no power is supplied to the H205 and signals below the threshold level are muted out. The muting threshold level can be varied by adjusting the trimming resistor R245.

The DC voltage developed at the collector of H208 is also used to make the Auto-Stereo switching transistor H304 turn on and off.

3-2 MPX Stereo Decoding Circuit

Non-equalized audio signals are applied to the first amplifier H301 which serves as a tuned amplifier for the pilot signal in the composite signals and as a buffer amplifier for the rest audio signals. The amplified 19KHz pilot signal is led to the second 19KHz amplifier H302 and further amplified if switching transistor H304 is turned on by the controlling DC signal as described above. The 19KHz pilot signal is rectified by the doubler circuit consisting of H312 and H313 to obtain synchronized 38KHz signal to drive the H303. The H303 is the 38KHz tuned amplifier and supplies its output to the switching matrix circuit consisting of four diodes. The composite signals are applied to the center tap of switching transformer L304 and decoded into left and right channel signals, then both channel signals are led to the crosstalk cancelling amplifier which utilizes complementary configuration with NPN and PNP transistors through de-emphasis networks. Transistors H310 and H311 are buffer amplifiers and their outputs are led to the function switch.

3.3 Suggestion for Trouble Shooting of FM Tuner

3.3.1 Symptom: No FM Reception

First turn ON the power switch and try to tune FM stations. Rotate the fly-wheel tuning knob slowly and observe the FM tuning meter. If the meter deflect at several frequencies received, the circuits preceding the IF amplifier H204 may have no failure. When no reading is obtained in the meter, check FM local oscillator circuit, using a RF VTVM. The normal local oscillator voltage is one or two volts (rms) at the tuning capacitor, depending on the tuning capacitor position. If the local oscillator voltage is normal, next check all voltage distributions in the FM circuits and compare them with those shown in the circuit diagram. When the tuning meter deflects but no sound is obtained, check audio circuits, using a high sensitive oscilloscope.

3.3.2 Symptom: No Stereo Separation

First check the "MONO" switch is in normal out position. Connect a FM-RF signal generator output modulated by a stereo modulator to the rear FM antenna terminals, and check the stereo beacon is turned on or not. If not turned on, check for 19KHz pilot signal and 38KHz switching signal, using an oscilloscope.

4. Phono and Pre-amplifier

Signals from the tuner and AUX jacks are applied to the selector switch. Signals from the PHONO jacks are applied to the phono-amplifier consisting of transistor H901, H903 and H905. The gain of the amplifier is 40 dB. The amplified and equalized phono-signals are, then, fed to other section of the selector switch which, in turn, applies output signals from the tuner, phono-amplifier and AUX jacks to the TAPE MONITOR switch and TAPE OUT jacks. The TAPE MONITOR switch applies the signals to the balance and volume controls.

The controlled signals are fed to the pre-amplifier consisting of H501, H503 and H505. Frequency response of the amplifier can be varied by BASS and TREBLE controls. The controlled output are then led to the main amplifier through high and low pass filter pushswitches.

5. Main Amplifier

Transistor H701 is a pre-driver coupled to the transistor H703 through capacitor C711. Transistor H703 drives the inverter transistors H709 and H710 which, in turn, drive the power stage consisting of H001 and H002. Transistors H705 and H709 are current limiters and operate as power protecting circuits.

Excessive currents flowing into the power stage are detected by the resistors R741 and R745 and the resultant variations are applied to the transistors H705 and H707 and make them turned on. This decreases the current flowing into the H709 and H710. In this way the currents flowing in the power stage (H001 and H002) are restricted within a safe value.

6. Audio Trouble Analysis

- | | |
|--------------------------------------|---|
| 1. Excessive line consumption | a. Check for shorted rectifiers H007, H804, H805.
b. Check for shorted transistors H001, H002, Check L002 for short. |
| 2. No line consumption or zero bias. | a. Check line cord, fuse, shorted H005, H006, H713 & H714.
b. Check for open rectifiers H007, H804, H805 or open L002. |
| 3. High hum and noise level. | a. Check filter capacitors C006, C703, & C704. |
| 4. Parastic oscillation | a. Check for defective capacitors, C705, C706, C713, C714, C723 & C724. |
| 5. Improper clipping | a. Check for proper adjustment of 723 & 724. |

7. Test Equipment Required for Servicing

Table 1 lists the test equipment required for servicing the Model 2220 Receiver.

Item	Manufacturer and Model No.	Use
AM Signal Generator		Signal source for AM alignment
Test Loop		Use with AM Signal generator
FM Signal Generator	Less than 0.3% distortion	Signal source for FM alignment
Stereo Modulator	Less than 0.3% distortion	Stereo Separation alignment and trouble shooting
Audio Oscillator	Weston Model CVO-100P, less than 0.02% residual distortion is required.	Sinewave and squarewave signal source.
Oscilloscope	High sensitivity with DC horizontal and vertical amplifiers.	Waveform analysis and Trouble Shooting, and ASO alignment.
VTVM	With AC, DC, RF range	Voltage measurements.
Circuit Tester		Trouble Shooting
AC Wattmeter	Simpson, Model 390	Monitors primary power to Amplifier.
AC Ammeter	Commercial Grade (1-10A)	Monitors amplifier output under short circuit condition.
Line Voltmeter	Commercial Grade (0-150VAC)	Monitors potential of primary power to amplifier
Variable Autotransformer (0-140VAC, 10 amps.)	Powerstat, Model 116B	Adjusts level of primary power to amplifier.
Shorting Plug	Use phono plug with 600 ohm across center pin and shell.	Shorts amplifier input to eliminate noise pickup.
Output Load (8 ohms, 0.5%, 100W)	Commercial Grade	Provides 8-ohm load for amplifier output termination.
Output Load (4 ohms, 0.5%, 100W)	Commercial Grade	Provides 4-ohm load for amplifier output termination.

8. AM Alignment Procedure

AM IF Alignment

1. Connect a sweep generator to the J102 and an alignment scope to the resistor R121(out side) .
2. Rotate each core of IF transformers L102 and L103 for the maximum height and flat top symmetrical response.

AM Frequency Range and Tracking Alignment

1. Set AM signal generator to 525 KHz. Turn the tuning capacitor fully closed (place the tuning pointer at the low end) and adjust the oscillator coil L101 for maximum audio output.
2. Set the signal generator to 1650 KHz. Place the tuning pointer in the high frequency end and adjust the trimming capacitor CA-2 for maximum audio output.

3. Repeat step 1 and 2 until no further adjustment is necessary.
 4. Set the generator to 600 KHz, tune the receiver to the same frequency and adjust a slug core of AM ferrite rod antenna for maximum output.
 5. Set the generator to 1400 KHz and tune the receiver to the same frequency and adjust the trimming capacitor CA-1 for maximum output.
 6. Repeat procedures 4 and 5 until no further adjustment is necessary.
- Note: During tracking alignment reduce the signal generator output as necessary to avoid AGC action.

9. FM Alignment Procedure

1. Connect a FM signal generator to the FM antenna terminals and an oscilloscope and an audio distortion analyzer to the tape output jack on the rear panel.
2. Set the FM SG to 87.5 MHz and provide about 3 to 5 μ V. Place the tuning pointer at the low frequency end by rotating the tuning knob and adjust the core of oscillator coil L108 to obtain maximum audio output.
3. Set the FM SG to 108.5 MHz and provide about 3 to 5 μ V. Rotate the tuning knob and place the tuning pointer at the high frequency end and adjust the trimming capacitor C152 for maximum output.
4. Repeat steps 2 and 3 until no further adjustment is necessary.
5. Set the FM SG to 90 MHz and tune the receiver to the same frequency. Decrease signal generator output until the audio output level decreases with the decreasing generator output. Adjust the RF coil L107 and antenna coil L106 and IF transformer L109 for minimum audio distortion.
6. Set the FM SG to 106 MHz and tune the receiver to the same frequency. Decrease the signal generator output until the audio output level decreases with the decreasing generator output. Adjust the trimming capacitor CF-1 and CF-2 for minimum distortion.
7. Repeat steps 5 and 6 until no further adjustment is necessary.
8. Connect a DC VTVM with 1 V range selected to the resistor R237 (inside) and adjust the secondary core (black) of discriminator transformer L201 so that no voltage reading is obtained on the VTVM at no signal. Next set the FM SG to 98 MHz and increase the output level 1 K μ V, then tune the receiver to the same frequency so that no deflection is obtained on the VTVM. Adjust primary core (pink) of L201 for minimum distortion.

10. Stereo Separation Alignment

1. Set the FM SG to provide 1 K μ V at 98 MHz. Tune the receiver to the same frequency so that the VTVM connected to the Resistor R237 (inside) will give no readings.
2. Modulate the FM SG with 67 KHz audio frequency. Connect an oscilloscope to the R315. Adjust the core of L303 for minimum height of the 67 KHz signal on the scope.
3. Modulate the FM SG output with stereo composite signal consisting of subchannel signal only (of course, a pilot signal must be included). Adjust the core of L304 for maximum audio output, then modulate the signal generator output with a stereo composite signal consisting of L channel signal only and again adjust the core of L304 for maximum audio output.
4. Adjust the trimming resistor R329 for maximum and same separation in both channels.

11. Muting Threshold Adjustment

1. Set the FM SG output to provide 12.5 μ V (IHF) at 98 MHz and tune receiver to the same frequency. Adjust the trimming resistor R245 for the threshold level of 12.5 μ V. (During this adjustment turn the MUTING pushswitch "on".)

12. Audio Adjustment

1. Connect a VTVM across the resistor R747 and adjust the trimming resistor R729 until the VTVM reads 7.5mV DC. For the other channel connect the VTVM across the R748 and adjust the R730 for the same reading.
2. Connect an oscilloscope across the speaker terminals. Apply an audio signal of 1 KHz to the AUX jacks and increase the audio signal until the audio output on the scope begin to start clipping. Adjust the trimming resistor R723 for equal and symmetrical clipping. For the other channel adjust the R724.

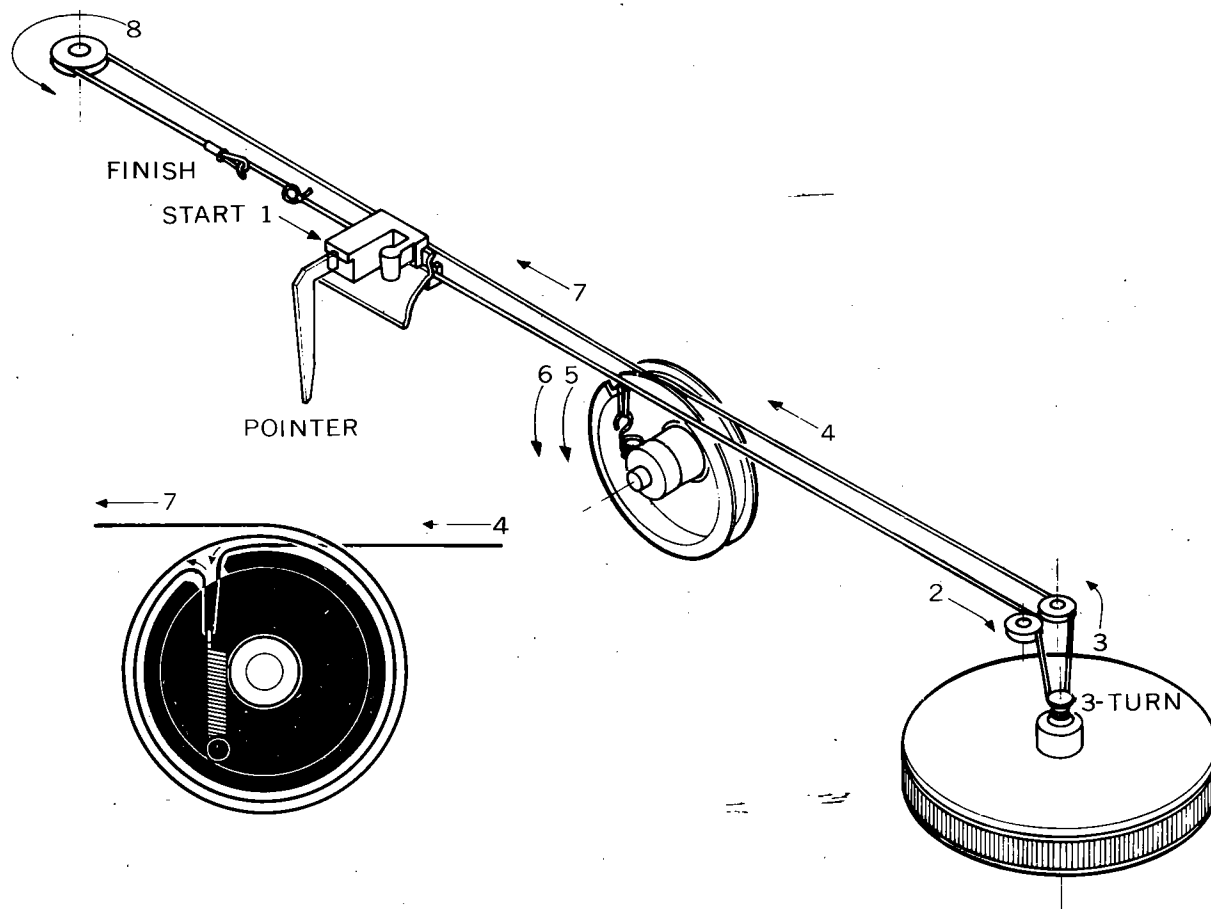


Figure 1. Dial Stringing

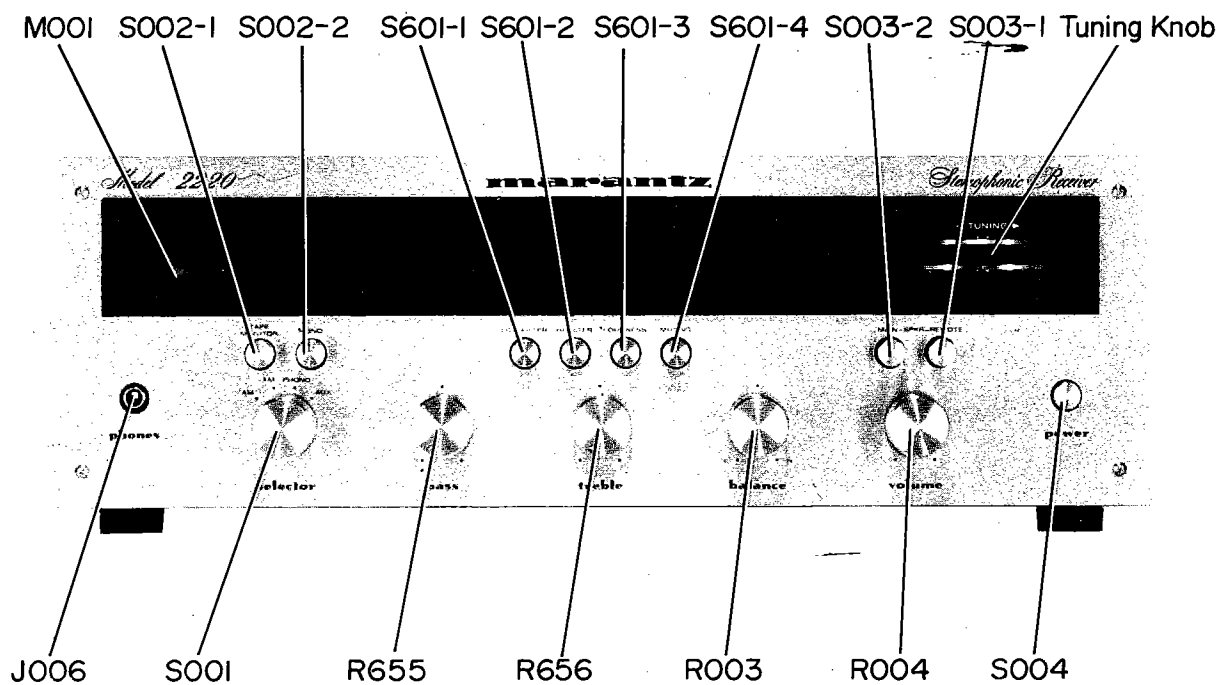


Figure 2. Front Panel Adjustments and Component Locations

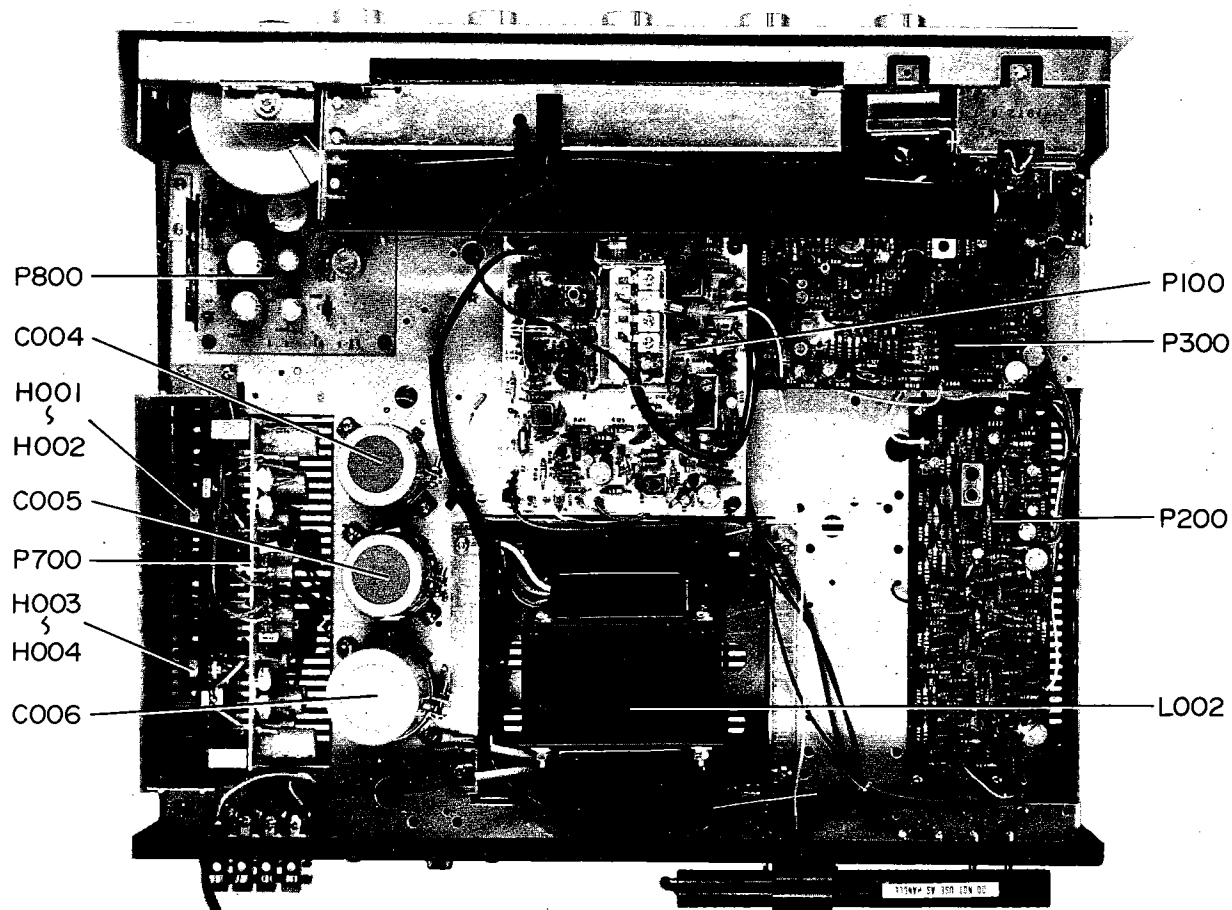


Figure 3. Main Chassis Component Locations (Top View)

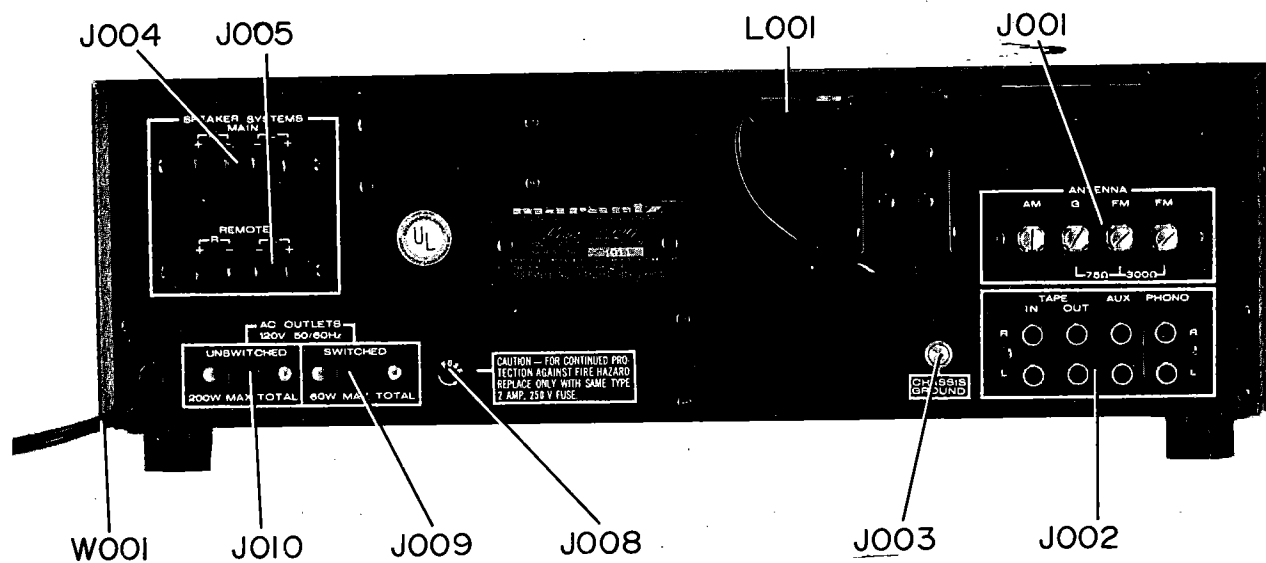


Figure 4. Rear Panel Adjustment and Component Locations

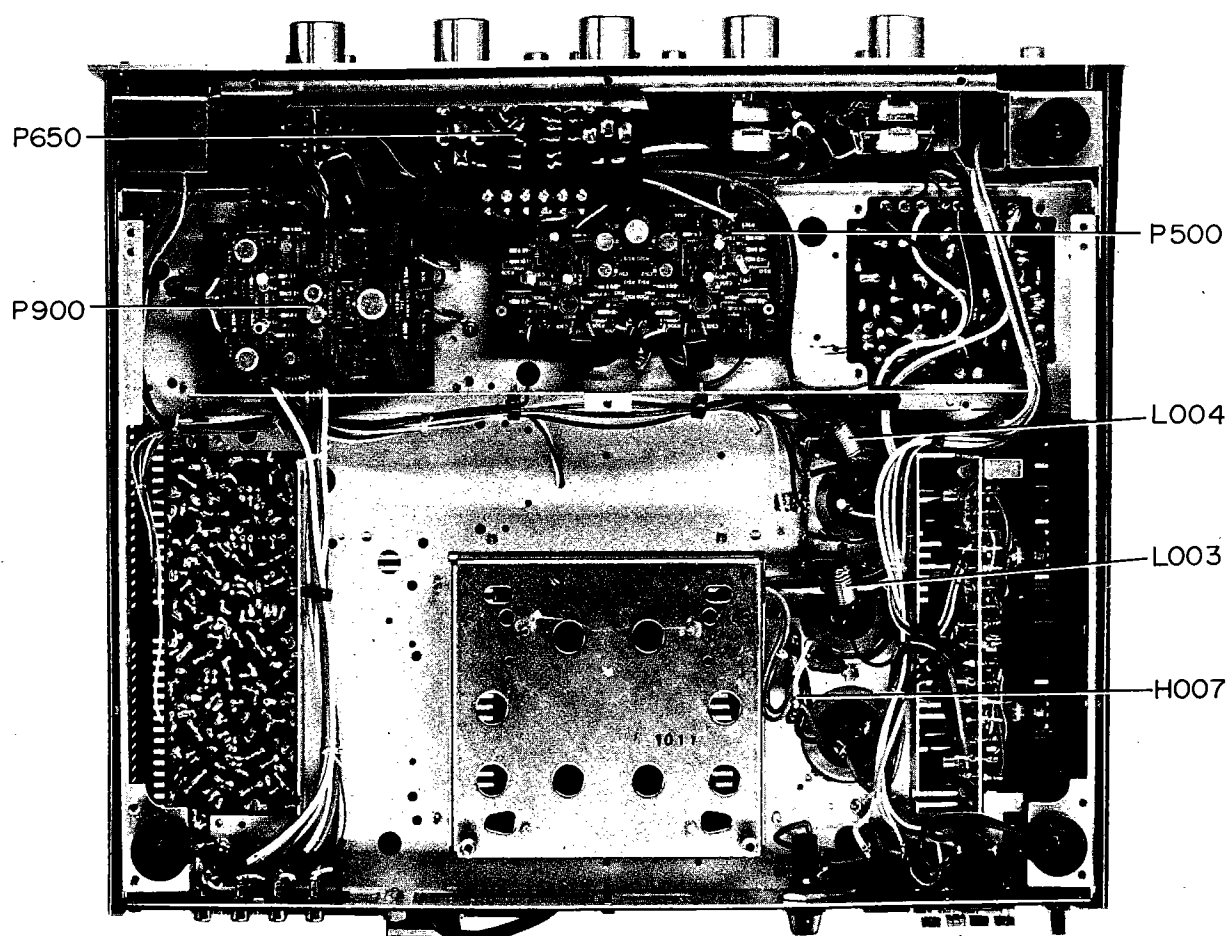


Figure 5. Main Chassis Component Locations (Bottom View)

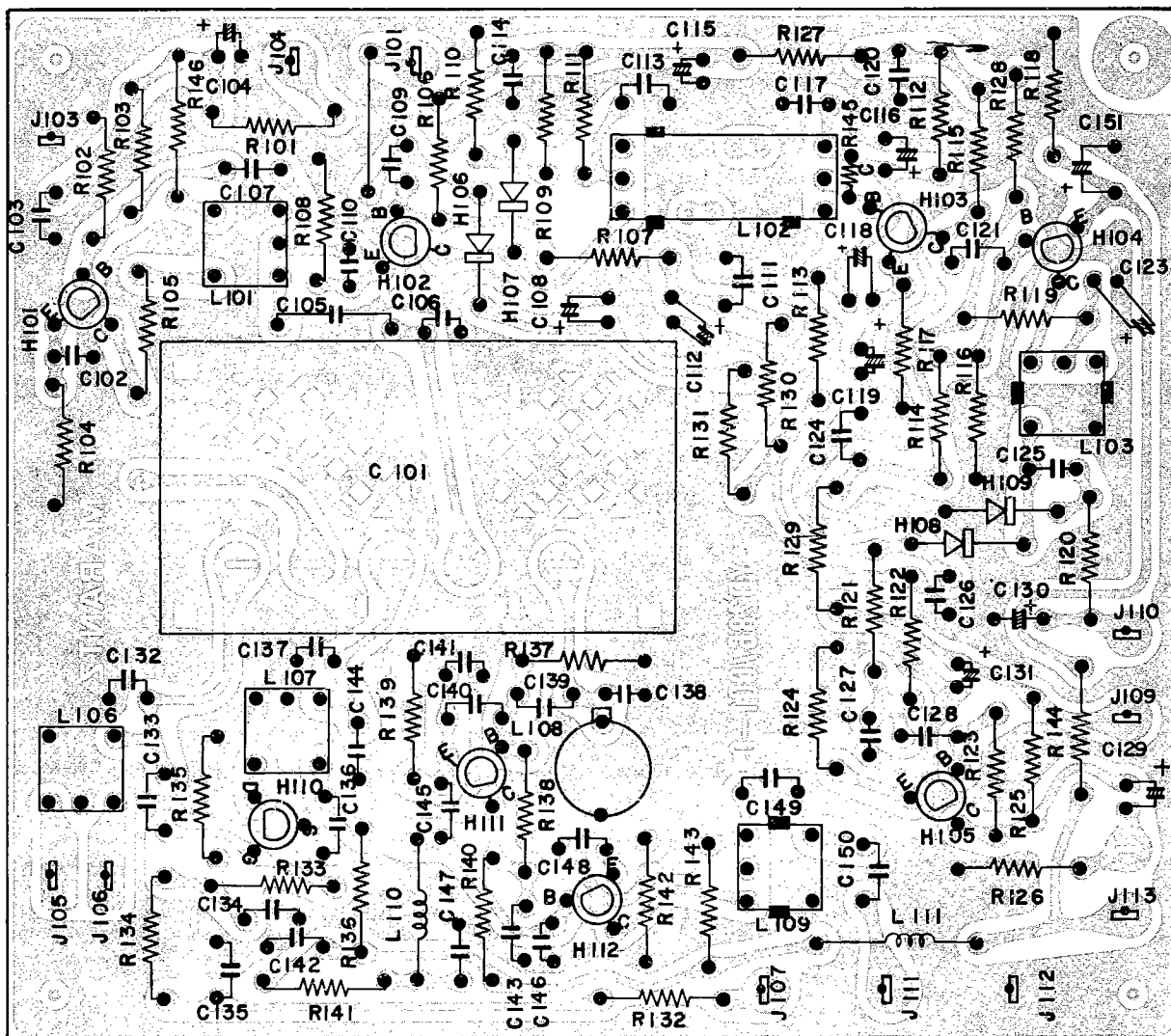


Figure 6. FM Front End and AM Tuner Assembly P100 Component Locations

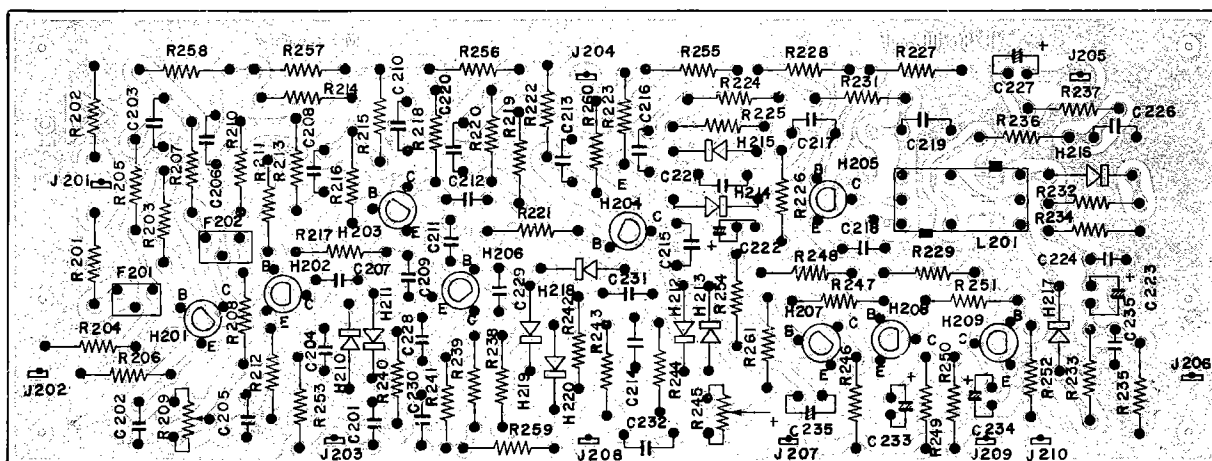


Figure 7. FM IF Amplifier, Detector, Muting Control and Meter Amplifier Unit Assembly P200 Component Locations

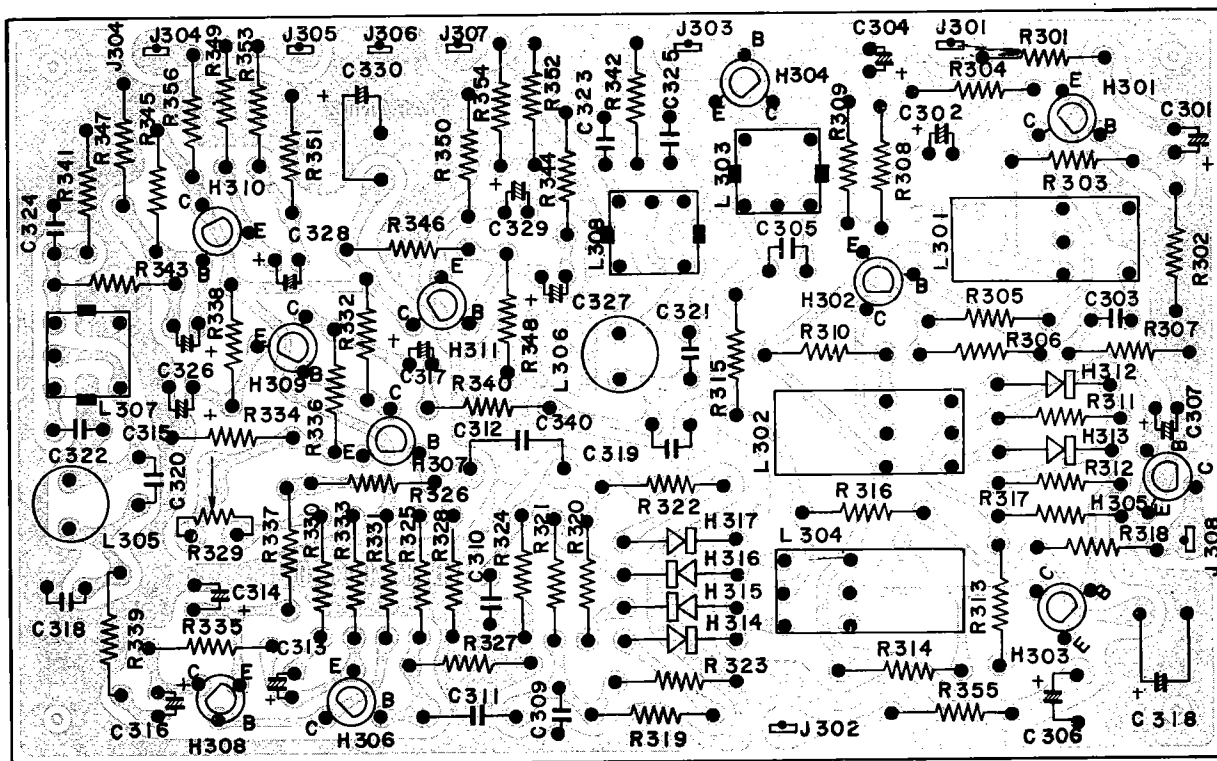


Figure 8. MPX Stereo Decoding Amplifier Assembly P300 Component Locations

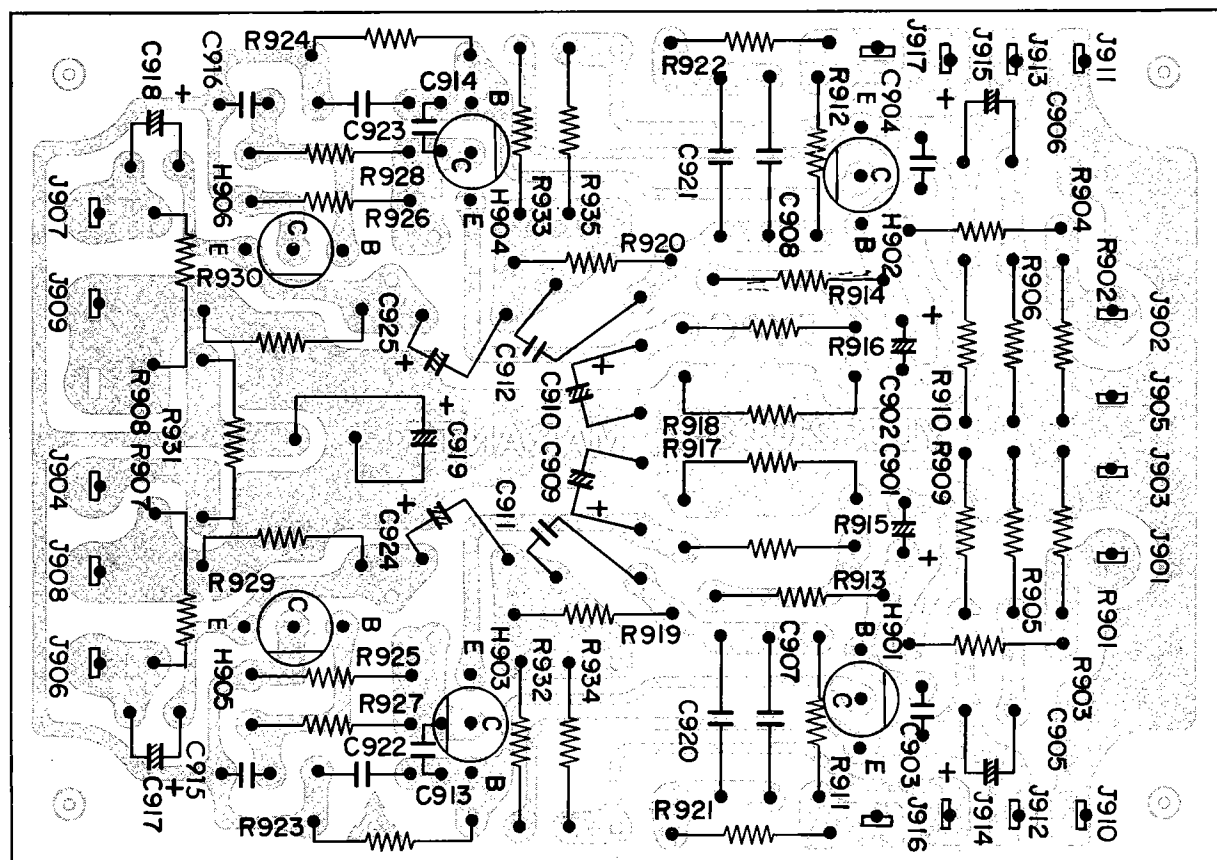


Figure 9. Phono Amplifier Assembly P900 Component Locations

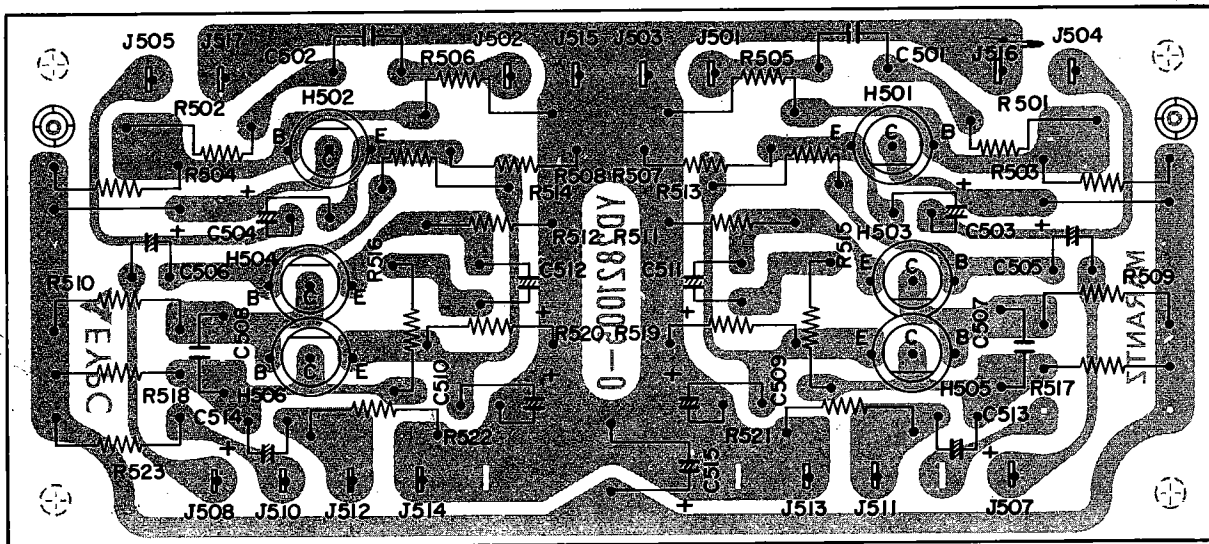


Figure 10. Tone Amplifier Assembly P500 Component Locations

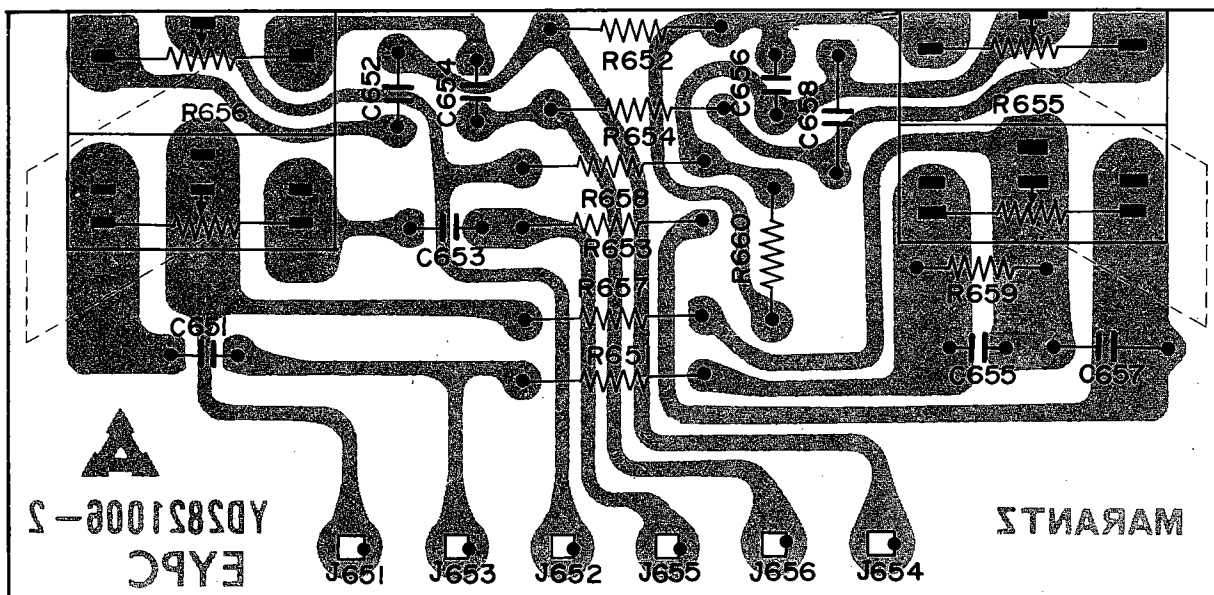
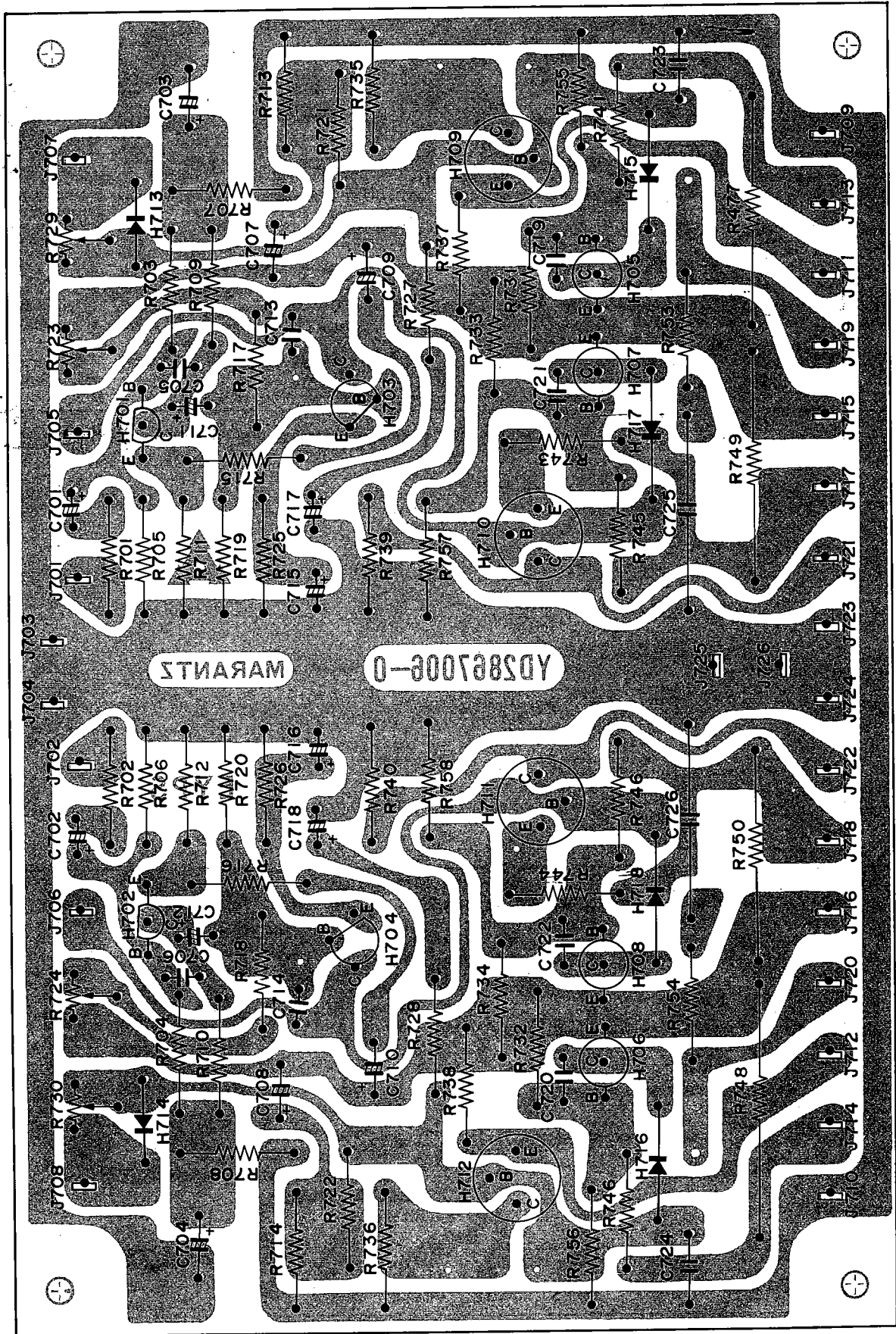


Figure 11. Tone Control Volume Unit Assembly P650 Component Locations



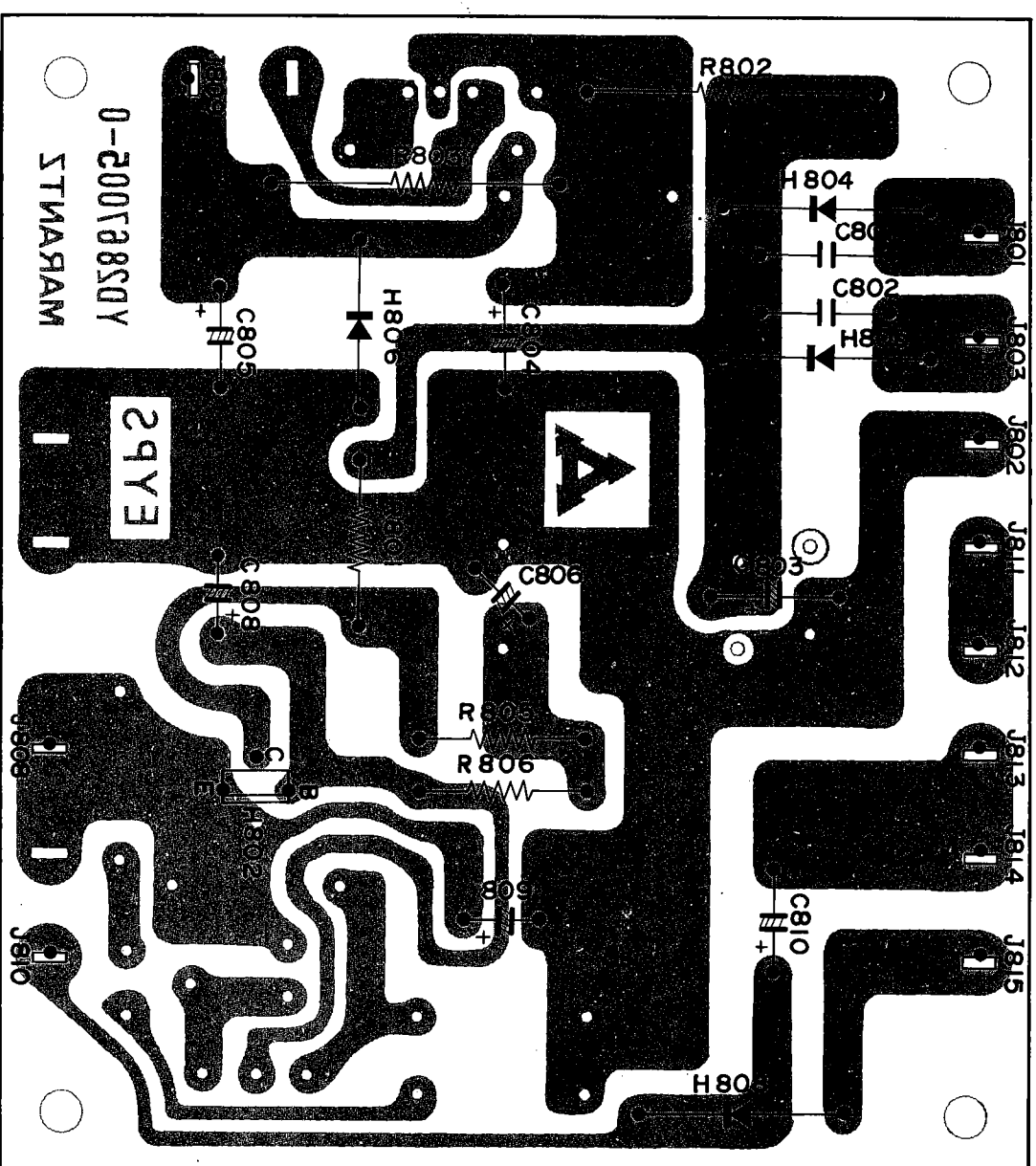


Figure 13. Power Supply Assembly P800 Component Locations

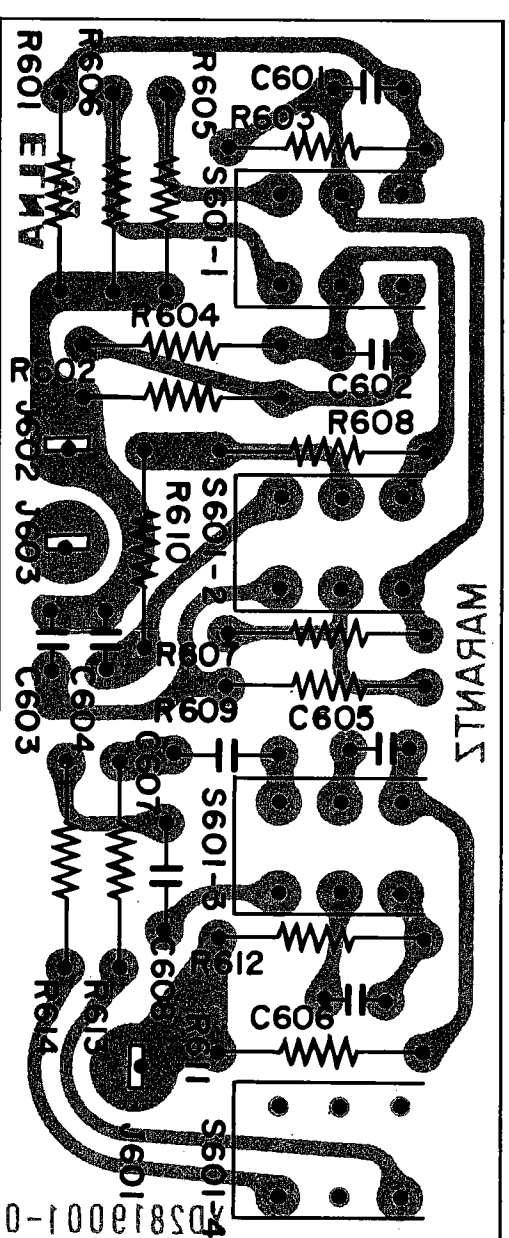


Figure 14. Loudness, Muting, High and Low-Filter Switch Unit Assembly P600 Component Locations

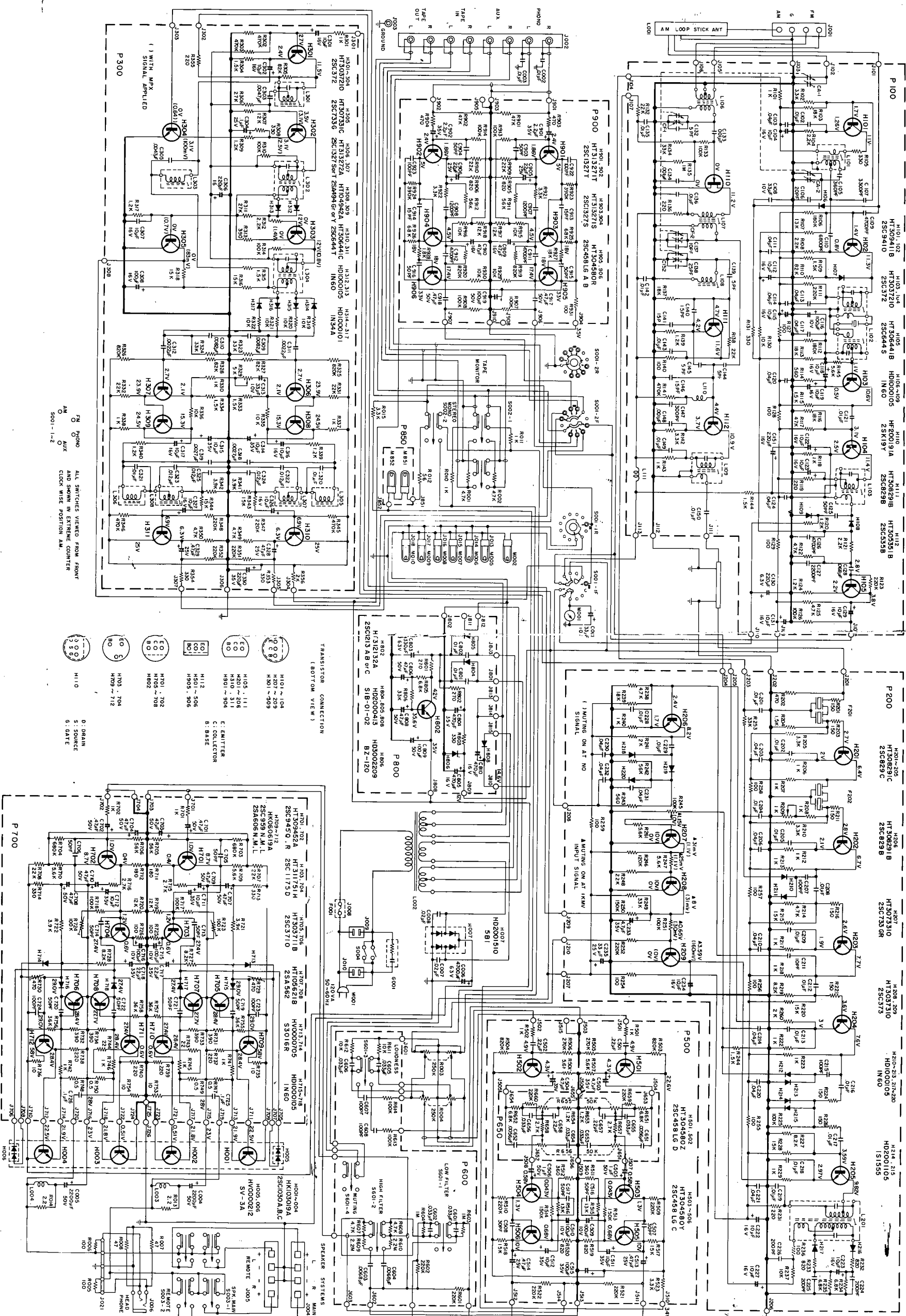


Figure 15. Schematic Diagram

2220B

PARTS LIST

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
A	286740140	Frame Assembly
0102	286706301	Escutcheon
0202	281840101	Frame
0204	281815801	Window
0215	273125901	Bush
0219	282105302	Cover
0226	281825905	Bush
B	286716040	Bracket Assembly
0126	286726501	Indicator
0313	282116002	Bracket
0902	51100308S	B.H.M. Screw
0903	53110303E	Hexagon Nut
0904	51100306S	B.H.M. Screw
0905	55060307F	T.R. Rivet
0906	54050300R	T.L. Washer OR
0911	51100306S	B.H.M. Screw
0912	51100306S	B.H.M. Screw
0923	54050400R	T.L. Washer OR
0924	54020401E	Flat Washer P
0925	53110403E	Hexagon Nut
J001	YT0104011	Terminal, FM/AM Ant.
J002	YT0208002	Terminal, 8P
J003	YL0301021	Terminal, Ground
J004	YT0304002	Terminal, Spk.
J005	YT0304002	Terminal, Spk.
J009	YJ0400018	Jack, AC Outlet
J010	YJ0400018	Jack, AC Outlet
C	286727340	Fly Wheel Assembly
0121	257706302	Escutcheon
0122	257706303	Escutcheon
0123	257727301	Fly Wheel
0410	285311201	Shaft
0831	53110603A9	Hexagon Nut
0832	54040602A	Spring Washer
0833	54020601E	Flat Washer P
D	286710340	Pointer Assembly
0210	281810301	Pointer
0211	281810302	Pointer
0212	281805301	Cover
M002	IN1008018	Lamp
0104	281815401	Knob
0106	281815402	Knob
0117	281825701	Lid
0118	281825702	Lid
0131	281912002	Insulator
0206	281811801	Spacer
0208	281810701	Sheet
0217	275905701	Leg
0221	286730201	Dial

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0303	281810501	Chassis
0304	281810502	Chassis
0305	281810101	Support
0306	286710101	Support
0307	286716002	Bracket
0308	51570306B	P.H. Tapt Screw
0315	281816003	Bracket
0316	281816004	Bracket
0318	281816001	Bracket
0319	282610106	Support
0320	282610105	Support
0321	281805501	Collar
0322	281810401	Retainer
0326	282127401	Reflector
0327	281927401	Reflector
0329	281827101	Holder
0331	281927101	Holder
0401	281805101	Guide
0403	281816005	Bracket
0407	281810603	Bearing
0408	285310601	Bearing
0413	281816010	Bracket
0414	257726201	Pulley
0415	137011203	Shaft
0418	281816011	Bracket
0419	127126201	Pulley
0420	137011203	Shaft
0422	257912001	Insulator
0425	141511801	Spacer
0426	257710602	Bearing
0427	285011202	Shaft
0428	54040402N	Spring Washer
0432	281916001	Bracket
0433	281905301	Cover
0502	257816005	Bracket
0503	257816006	Bracket
0504	550203041	S.H. Rivet
0506	145525901	Bush
0516	286726701	Heat Sink
0517	286716001	Bracket
0520	282016007	Bracket
0524	281811806	Spacer
0530	282026702	Heat Sink
0602	281800401	Table
0603	281810105	Support
0612	282110901	Shield
0613	286710901	Shield
0628	286726901	Protector
0701	281915901	Drum
0703	71101569M	Spring
0706	282010701	Sheet
0710	282110103	Support
0711	120225801	Hook

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0716	273025901	Bush
0718	138200503	Clamper
0722	72080802A	String
0725	257711803	Spacer
0729	282111801	Spacer
0732	282100501	Clamper
0734	281927103	Holder
0802	51570305B0	P.H. Tapt Screw
0804	51570306B0	P.H. Tapt Screw
0806	51570312B0	P.H. Tapt Screw
0807	54050300R	T.L. Washer OR
0808	51100306E9	B.H.M. Screw
0809	51040306A9	F.H.M. Screw
0810	51640410D9	Set Screw C.P
0811	54040402A	Spring Washer
0812	53110403E9	Hexagon Nut
0814	51570408B0	P.H. Tapt Screw
0815	51570306B0	P.H. Tapt Screw
0816	51570306B0	P.H. Tapt Screw
0818	51042606S0	F.H.M. Screw
0820	51570306B0	P.H. Tapt Screw
0821	51570306B0	P.H. Tapt Screw
0822	51570306B0	P.H. Tapt Screw
0824	51570306B0	P.H. Tapt Screw
0825	51570306B0	P.H. Tapt Screw
0909	51100306S9	B.H.M. Screw
0910	51100306S9	B.H.M. Screw
0916	53110303E9	Hexagon Nut
0919	51100310S9	B.H.M. Screw
0920	54050300R	T.L. Washer OR
0921	53110303E9	Hexagon Nut
0926	51122608E	T.H.M. Screw
0928	51100406S9	B.H.M. Screw
0930	51100406S9	B.H.M. Screw
0931	54020401S	Flat Washer P
0933	51100410A9	B.H.M. Screw
0934	54040402W	Spring Washer
0935	54020401E	Flat Washer P
1002	51570305B0	P.H. Tapt Screw
1003	51570306B0	P.H. Tapt Screw
1006	51570305B0	P.H. Tapt Screw
1008	51100312E9	B.H.M. Screw
1009	53110303E9	Hexagon Nut
1010	54040302N	Spring Washer
1011	62031650W	Lug
1013	51100306S9	B.H.M. Screw
1015	51100308S9	B.H.M. Screw
1016	51570408B0	P.H. Tapt Screw
1017	51102606A0	B.H.M. Screw
1018	53110501A9	Hexagon Nut
1026	51570408B0	P.H. Tapt Screw
1031	51570408B0	P.H. Tapt Screw
1033	54020401A	Flat Washer P
1034	62031650W	Lug
1035	54050300R	T.L. Washer OR

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
1102	51100306S9	B.H.M. Screw
1103	51100306S9	B.H.M. Screw
1104	51100306S9	B.H.M. Screw
1106	51570306B0	P.H. Tapt Screw
1108	51100306S9	B.H.M. Screw
1110	51100306S9	B.H.M. Screw
1121	51570306B0	P.H. Tapt Screw
1127	51570312B0	P.H. Tapt Screw
1129	51570306B0	P.H. Tapt Screw
1130	51570306B0	P.H. Tapt Screw
1133	51570306B0	P.H. Tapt Screw
1202	51650304D9	Set Screw H.P.
1212	56382540G	Eyelet
1214	54020301E	Flat Washer P
1216	51100310S9	B.H.M. Screw
1217	53110303E9	Hexagon Nut
1218	54050300R	T.L. Washer OR
P100	YD2867001 (ZZ2867001)	P.C. Board FM Front & AM P.C. Board Assembly
RESISTORS (All resistors are $\pm 5\%$, 1/4W and carbon type, unless otherwise indicated.)		
R101	RT0510214	1K Ω
R102	RT0533214	3.3K Ω
R103	RT0518314	18K Ω
R104	RT0522214	2.2K Ω
R105	RT0533114	330 Ω
R106	RT0518414	180K Ω
R107	RT0513314	13K Ω
R108	RT0522214	2.2K Ω
R109	RT0515214	1.5K Ω
R110	RT0582314	82K Ω
R111	RT0522114	220 Ω
R112	RT0518414	180K Ω
R113	RT0518314	18K Ω
R114	RT0556114	560 Ω
R115	RT0515214	1.5K Ω
R116	RT0518314	18K Ω
R117	RT0547314	47K Ω
R118	RT0510214	1K Ω
R119	RT0522114	220 Ω
R120	RT0512214	1.2K Ω
R121	RT0522214	2.2K Ω
R122	RT0547214	4.7K Ω
R123	RT0522414	220K Ω
R124	RT0518214	1.8K Ω
R125	RT0547214	4.7K Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
R126	RT0510414	100K Ω	
R127	RT0510114	100 Ω	
R128	RT0510114	100 Ω	
R129	RT0510114	100 Ω	
R130	RT0510314	10K Ω	
R131	RT0513314	13K Ω	
R132	RT0522314	22K Ω	
R133	RT0510414	100K Ω	
R134	RT0533314	33K Ω	
R135	RT0510514	1M Ω	
R136	RT0522114	220 Ω	
R137	RT0518314	18K Ω	
R138	RT0522314	22K Ω	
R139	RT0512214	1.2K Ω	
R140	RT0510114	100 Ω	
R141	RT0547414	470K Ω	
R142	RT0533214	3.3K Ω	
R143	RT0510214	1K Ω	
R144	RT0515214	1.5K Ω	
R145	RT0556214	5.6K Ω	
R146	RT0515114	150 Ω	
CAPACITORS			
C101	CA3240007	Variable	Tuning Capacitor
C102	DF1710301	Film	0.01 μ F, \pm 20%
C103	DF1740301	Film	0.04 μ F, \pm 20%
C104	EA1060169	Electroly	10 μ F, 16V
C105	DF6536150	Film	360pF, \pm 5%
C106	DD1620004	Ceramic	20pF, \pm 10%
C107	DF1633201	Film	3300pF, \pm 10%
C108	EA3360109	Electroly	33 μ F, 10V
C109	DF1747201	Film	4700pF, \pm 20%
C110	DF1668201	Film	6800pF, \pm 10%
C111	DF1740301	Film	0.04 μ F, \pm 20%
C112	EA1060169	Electroly	10 μ F, 16V
C113	DF1740301	Film	0.04 μ F, \pm 20%
C114	DF1740301	Film	0.04 μ F, \pm 20%
C115	EA1060169	Electroly	10 μ F, 16V
C116	EA2260109	Electroly	22 μ F, 10V
C117	DF1740301	Film	0.04 μ F, \pm 20%
C118	EA1060169	Electroly	10 μ F, 16V
C119	EA1060169	Electroly	10 μ F, 16V
C120	DF1740301	Film	0.04 μ F, \pm 20%
C121	DF1710301	Film	0.01 μ F, \pm 20%
C123	EA1060169	Electroly	10 μ F, 16V
C124	DF1740301	Film	0.04 μ F, \pm 20%
C125	DD1650101	Ceramic	500pF, \pm 10%
C126	DF1747201	Film	4700pF, \pm 20%
C127	DF1722201	Film	2200pF, \pm 20%
C128	DF1768301	Film	0.068 μ F, \pm 20%
C129	EA1060169	Electroly	10 μ F, 16V
C130	EA2270069	Electroly	220 μ F, 6.3V
C131	EA1060169	Electroly	10 μ F, 16V
C132	DD1205001	Ceramic	5pF, \pm 1pF
C133	DK1710201	Ceramic	0.001 μ F, \pm 20%
C134	DK1710201	Ceramic	0.001 μ F, \pm 20%
C135	DK1710301	Ceramic	0.01 μ F, \pm 20%
C136	DK1710301	Ceramic	0.01 μ F, \pm 20%
C137	DD1210001	Ceramic	10pF, \pm 1pF
C138	DD1525002	Ceramic	25pF \pm 5%
C139	DD1207003	Ceramic	7pF, \pm 1pF
C140	DD1615003	Ceramic	15pF, \pm 10%

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
C141	DD1615003	Ceramic	15pF, \pm 10%
C142	DK1710301	Ceramic	0.01 μ F, \pm 20%
C143	DK1710301	Ceramic	0.01 μ F, \pm 20%
C144	DD1205001	Ceramic	5pF, \pm 1pF
C145	DD1205001	Ceramic	5pF, \pm 1pF
C146	DD1615001	Ceramic	15pF, \pm 10%
C147	DD1530101	Ceramic	300pF, \pm 5%
C148	DK1710201	Ceramic	0.001 μ F, \pm 20%
C149	DK1710301	Ceramic	0.01 μ F, \pm 20%
C150	DK1710301	Ceramic	0.01 μ F, \pm 20%
C151	EA2270169	Electroly	220 μ F, 16V
C152	CT1100008	Trimming	1.5pF — 11.5pF
C153	EA1070169	Electroly	100 μ F, 16V
COILS AND TRANSFORMERS			
L101	LO1004034	AM OSC Coil	
L102	LI1028002	AM IF Coil	
L103	LI1001048	AM IFT	
L106	LA1004606	FM ANT Coil	
L107	LA1027809	FM RF Coil	
L108	LO1203601	FM OSC Coil	
L109	LI1001601	FM IFT	
L110	LC1751001	Choke Coil	
L111	LC1752001	Choke Coil	
SEMICONDUCTORS			
H101	HT309411B	Transistor	2SC941 (O)
H102	HT309411B	Transistor	2SC941 (O)
H103	HT3037210	Transistor	2SC372
H104	HT3037210	Transistor	2SC372
H105	HT306441B	Transistor	2SC644
H106	HD1000105	Diode	IN60
H107	HD1000105	Diode	IN60
H108	HD1000105	Diode	IN60
H109	HD1000105	Diode	IN60
H110	HF200191A	FET	2SK19 (Y)
H111	HT308291B	Transistor	2SC829 (B)
H112	HT305354B	Transistor	2SC535 (B)
MISCELLANEOUS			
J101	YP1000094	Plug	
J103	YP1000094	Plug	
J104	YP1000094	Plug	
J105	YP1000094	Plug	
J106	YP1000094	Plug	
J107	YP1000094	Plug	
J108	YP1000094	Plug	
J109	YP1000094	Plug	
J110	YP1000094	Plug	
J111	YP1000094	Plug	
J112	YP1000094	Plug	
J113	YP1000094	Plug	
P200	YD2867002 (ZZ2867002)	P.C. Board	FM IF
RESISTORS (All resistors are \pm 5%, 1/4W and carbon type, unless otherwise indicated.)			
R201	RT0515114	150 Ω	
R202	RT0547114	470 Ω	

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
R203	RT0515114	150Ω	
R204	RT0515214	1.5KΩ	
R205	RT0533214	3.3KΩ	
R206	RT0510214	1KΩ	
R207	RT0510214	1KΩ	
R208	RT0510214	1KΩ	
R209	RA0102015	Trimming	1KΩ (B)
R210	RT0533214	3.3KΩ	
R211	RT0515114	150Ω	
R212	RT0510214	1KΩ	
R213	RT0510214	1KΩ	
R214	RT0547214	4.7KΩ	
R215	RT0515314	15KΩ	
R216	RT0515114	150Ω	
R217	RT0510214	1KΩ	
R218	RT0510214	1KΩ	
R219	RT0582214	8.2KΩ	
R220	RT0515314	15KΩ	
R221	RT0515114	150Ω	
R222	RT0510214	1KΩ	
R223	RT0510214	1KΩ	
R224	RT0515114	150Ω	
R225	RT0510414	100KΩ	
R226	RT0515114	150Ω	
R227	RT0582214	8.2KΩ	
R228	RT0515314	15KΩ	
R229	RT0510214	1KΩ	
R231	RT0522114	220Ω	
R232	RT0582114	820Ω	
R233	RT0582114	820Ω	
R234	RT0568214	6.8KΩ	
R235	RT0568214	6.8KΩ	
R236	RT0510114	100Ω	
R237	RT0510314	10KΩ	
R238	RT0547214	4.7KΩ	
R239	RT0518314	18KΩ	
R240	RT0510214	1KΩ	
R241	RT0520214	2KΩ	
R242	RT0556314	56KΩ	
R243	RT0556114	560Ω	
R244	RT0515314	1.5KΩ	
R245	RA0104012	Trimming	100KΩ (B)
R246	RT0512414	120KΩ	
R247	RT0556214	5.6KΩ	
R248	RT0522314	22KΩ	
R249	RT0533314	33KΩ	
R250	RT0515414	150KΩ	
R251	RT0510414	100KΩ	
R252	RT0522414	220KΩ	
R253	RT0533314	33KΩ	
R254	RT0510114	100Ω	
R255	RT0510114	100Ω	
R256	RT0510114	100Ω	
R257	RT0510114	100Ω	
R258	RT0510114	100Ω	
R259	RT0510114	100Ω	
R260	RT0520214	2KΩ	
R261	RT0556214	5.6KΩ	
C201	DK1710301	Ceramic	0.01μF, ±20%
C202	DK1710301	Ceramic	0.01μF, ±20%
C203	DK1840302	Ceramic	0.04μF, +80% -20%

CAPACITORS

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
C204	DK1710301	Ceramic	0.01μF, ±20%
C205	DK1710301	Ceramic	0.01μF, ±20%
C206	DK1840302	Ceramic	0.04μF, +80% -20%
C207	DD1510101	Ceramic	100pF, ±5%
C208	DK1710301	Ceramic	0.01μF, ±20%
C209	DK1710301	Ceramic	0.01μF, ±20%
C210	DK1840301	Ceramic	0.04μF, +80% -20%
C211	DD1207001	Ceramic	7pF, ±1pF
C212	DK1710301	Ceramic	0.01μF, ±20%
C213	DK1710301	Ceramic	0.01μF, ±20%
C214	DK1840301	Ceramic	0.04μF, +80% -20%
C215	DD1510101	Ceramic	100pF, ±15%
C216	DK1710301	Ceramic	0.01μF, ±20%
C217	DK1710301	Ceramic	0.01μF, ±20%
C218	DK1710301	Ceramic	0.01μF, ±20%
C219	DK1710301	Ceramic	0.01μF, ±20%
C220	DK1840302	Ceramic	0.04μF, +80% -20%
C221	DK1840302	Ceramic	0.04μF, +80% -20%
C222	EA1060169	Electroly	10μF, 16V
C223	EA1060169	Electroly	10μF, 16V
C224	DD1620101	Ceramic	200pF, ±10%
C225	DD1620101	Ceramic	200pF, ±10%
C226	DD1620101	Ceramic	200pF, ±10%
C227	EA1060169	Electroly	10μF, 16V
C228	DK1710301	Ceramic	0.01μF, ±20%
C229	DK1710301	Ceramic	0.01μF, ±20%
C230	DK1840302	Ceramic	0.04μF, +80% -20%
C231	DK1840302	Ceramic	0.04μF, +80% -20%
C232	DK1840302	Ceramic	0.04μF, +80% -20%
C233	EA4750359	Electroly	4.7μF, 35V
C234	EA1060169	Electroly	10μF, 16V
C235	EA3360259	Electroly	33μF, 25V
SEMICONDUCTORS			
H201	HT308291C	Transistor	2SC829 (C)
H202	HT308291C	Transistor	2SC829 (C)
H203	HT308291C	Transistor	2SC829 (C)
H204	HT308291C	Transistor	2SC829 (C)
H205	HT308291C	Transistor	2SC829 (C)
H206	HT308291B	Transistor	2SC829 (B)
H207	HT3073310	Transistor	2SC733 GR
H208	HT3037310	Transistor	2SC373
H209	HT3037310	Transistor	2SC373
H210	HD1000105	Diode	IN60
H211	HD1000105	Diode	IN60
H212	HD1000105	Diode	IN60
H213	HD1000105	Diode	IN60
H214	HD2001105	Diode	IS1555
H215	HD2001105	Diode	IS1555
H216	HD1000105	Diode	IN60
H217	HD1000105	Diode	IN60
H218	HD1000105	Diode	IN60
H219	HD1000105	Diode	IN60
H220	HD1000105	Diode	IN60
MISCELLANEOUS			
F201	FF1107004	SFC 10.7 MC	
F202	FF1107004	SFC 10.7 MC	
J201	YP1000094	Plug	
J202	YP1000094	Plug	
J203	YP1000094	Plug	
J204	YP1000094	Plug	
J205	YP1000094	Plug	

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
J206	YP1000094	Plug	
J207	YP1000094	Plug	
J208	YP1000094	Plug	
J209	YP1000094	Plug	
J210	YP1000094	Plug	
L201	LI1018802	IFT	DET.
P300	YD2867003 (ZZ2867003)	P.C. Board P.C. Board Assembly	
RESISTORS (All resistors are $\pm 5\%$, 1/4W and carbon type, unless otherwise indicated.)			
R301	RT0510214	1K Ω	
R302	RT0547414	470K Ω	
R303	RT0547414	470K Ω	
R304	RT0515214	1.5K Ω	
R305	RT0582314	82K Ω	
R306	RT0527314	27K Ω	
R307	RT0512314	12K Ω	
R308	RT0522114	220 Ω	
R309	RT0512214	1.2K Ω	
R310	RT0510414	100K Ω	
R311	RT0527314	27K Ω	
R312	RT0522214	2.2K Ω	
R313	RT0539114	390 Ω	
R314	RT0556214	5.6K Ω	
R315	RT0515214	1.5K Ω	
R316	RT0515314	15K Ω	
R317	RT0512214	1.2K Ω	
R318	RT0515314	15K Ω	
R319	RT0510314	10K Ω	
R320	RT0510314	10K Ω	
R321	RT0510314	10K Ω	
R322	RT0510314	10K Ω	
R323	RT0527314	27K Ω	
R324	RT0527314	27K Ω	
R325	RT0582414	820K Ω	
R326	RT0582414	820K Ω	
R327	RT0510414	100K Ω	
R328	RT0510414	100K Ω	
R329	RA0502013	Trimming	5 K Ω (B)
R330	RT0510214	1K Ω	
R331	RT0522314	22K Ω	
R332	RT0522314	22K Ω	
R333	RT0515214	1.5K Ω	
R334	RT0515214	1.5K Ω	
R335	RT0510314	10K Ω	
R336	RT0510314	10K Ω	
R337	RT0510214	1K Ω	
R338	RT0510214	1K Ω	
R339	RT0512214	1.2K Ω	
R340	RT0512214	1.2K Ω	
R341	RT0539214	3.9K Ω	
R342	RT0539214	3.9K Ω	
R343	RT0515314	15K Ω	
R344	RT0515314	15K Ω	
R345	RT0547414	470K Ω	
R346	RT0547414	470K Ω	
R347	RT0522414	220K Ω	
R348	RT0522414	220K Ω	

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
R349	RT0547214	4.7K Ω	
R350	RT0547214	4.7K Ω	
R351	RT0522414	220K Ω	
R352	RT0522414	220K Ω	
R353	RT0533114	330 Ω	
R354	RT0533114	330 Ω	
R355	RT1022114	220 Ω	$\pm 10\%$, 1/4W
R356	RT0520214	2K Ω	
CAPACITORS			
C301	EA1060169	Electroly	10 μ F, 16V
C302	EA1060169	Electroly	10 μ F, 16V
C303	DF1647201	Film	0.0047 μ F, $\pm 10\%$
C304	EM1040251	Electroly	0.1 μ F, 25V
C305	DF5547201	Film	0.0047 μ F, $\pm 5\%$
C306	EA2270169	Electroly	220 μ F, 16V
C307	EA1060169	Electroly	10 μ F, 16V
C308	EA1070169	Electroly	100 μ F, 16V
C309	DF1582201	Film	0.0082 μ F, $\pm 5\%$
C310	DF1582201	Film	0.0082 μ F, $\pm 5\%$
C311	DF1722401	Film	0.22 μ F, $\pm 20\%$
C312	DF1722401	Film	0.22 μ F, $\pm 20\%$
C313	EA3360109	Electroly	33 μ F, 10V
C314	EA1060359	Electroly	10 μ F, 35V
C315	EA1060359	Electroly	10 μ F, 35V
C316	EA1060169	Electroly	10 μ F, 16V
C317	EA1060169	Electroly	10 μ F, 16V
C318	DF1627201	Film	0.0027 μ F, $\pm 10\%$
C319	DF1627201	Film	0.0027 μ F, $\pm 10\%$
C320	DF1610305	Film	0.01 μ F, $\pm 10\%$
C321	DF1610305	Film	0.01 μ F, $\pm 10\%$
C322	DF1612301	Film	0.012 μ F, $\pm 10\%$
C323	DF1612301	Film	0.012 μ F, $\pm 10\%$
C324	DF1612301	Film	0.012 μ F, $\pm 10\%$
C325	DF1612301	Film	0.012 μ F, $\pm 10\%$
C326	EA1060169	Electroly	10 μ F, 16V
C327	EA1060169	Electroly	10 μ F, 16V
C328	EV4740251	Electroly	0.47 μ F, 25V
C329	EV4740251	Electroly	0.47 μ F, 25V
C330	EA2270359	Electroly	220 μ F, 35V
COILS			
L301	LS1031001	MPX	
L302	LS1031002	MPX	
L303	LS1001505	MPX	
L304	LS1031003	Choke	
L305	LC2685001	Choke	
L306	LC2685001	Choke	
L307	LS1029003	Choke	
L308	LS1029003	Choke	
SEMICONDUCTORS			
H301	HT3037210	Transistor	2SC372
H302	HT3037210	Transistor	2SC372
H303	HT3037210	Transistor	2SC372
H304	HT3037210	Transistor	2SC372
H305	HT307331C	Transistor	2SC733 GR or BL
H306	HT313271S	Transistor	2SC1327 S or T
H307	HT313271S	Transistor	2SC1327 S or T
H308	HT104942A	Transistor	2SA494 Y or GR
H309	HT104942A	Transistor	2SA494 Y or GR
H310	HT306441C	Transistor	2SC644 T

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
H311	HT306441C	Transistor 2SC644 T
H312	HD1000105	Diode IN60
H313	HD1000105	Diode IN60
H314	HD1000101	Diode IN34A
H315	HD1000101	Diode IN34A
H316	HD1000101	Diode IN34A
H317	HD1000101	Diode IN34A
MISCELLANEOUS		
J301	YP1000094	Plug
J302	YP1000094	Plug
J303	YP1000094	Plug
J304	YP1000094	Plug
J305	YP1000094	Plug
J306	YP1000094	Plug
J307	YP1000094	Plug
J308	YP1000094	Plug
P900	YD2821008 (ZZ2867108)	P.C. Board For Phono Amp. P.C. Board Assembly
RESISTORS (All resistors are $\pm 5\%$, 1/4W and carbon type, unless otherwise indicated.)		
R901	RT0547314	47K Ω
R902	RT0547314	47K Ω
R903	RT0547114	470 Ω
R904	RT0547114	470 Ω
R905	RT0582114	820 Ω
R906	RT0582114	820 Ω
R907	RT0510414	100K Ω
R908	RT0510414	100K Ω
R909	RT0522314	22K Ω
R910	RT0522314	22K Ω
R911	RT0556314	56K Ω
R912	RT0556314	56K Ω
R913	RT0510414	100K Ω
R914	RT0510414	100K Ω
R915	RT0510314	10K Ω
R916	RT0510314	10K Ω
R917	RT0512314	12K Ω
R918	RT0512314	12K Ω
R919	RT0582414	820K Ω
R920	RT0582414	820K Ω
R921	RT0533214	3.3K Ω
R922	RT0533214	3.3K Ω
R923	RT0539414	390K Ω
R924	RT0539414	390K Ω
R925	RT0568314	68K Ω
R926	RT0568314	68K Ω
R927	RT0518214	1.8K Ω
R928	RT0518214	1.8K Ω
R929	RT0510314	10K Ω
R930	RT0510314	10K Ω
R931	RT0510114	100 Ω
CAPACITORS		
C901	EE2250351	Electroly 2.2 μ F, 35V, $\pm 20\%$
C902	EE2250351	Electroly 2.2 μ F, 35V, $\pm 20\%$
C903	DD1650001	Ceramic 50pF, 50V, $\pm 10\%$
C904	DD1650001	Ceramic 50pF, 50V, $\pm 10\%$
C905	EE2260251	Electroly 22 μ F, 25V, $\pm 20\%$
C906	EE2260251	Electroly 22 μ F, 25V, $\pm 20\%$

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
C907	DF5412201	Film 1200pF, 50V, $\pm 2\%$
C908	DF5412201	Film 1200pF, 50V, $\pm 2\%$
C909	EA4760169	Electroly 47 μ F, 16V
C910	EA4760169	Electroly 47 μ F, 16V
C911	DF5547201	Film 4700pF, 25V, $\pm 5\%$
C912	DF5547201	Film 4700pF, 25V, $\pm 5\%$
C913	DD1615001	Ceramic 15pF, 50V, $\pm 10\%$
C914	DD161500	Ceramic 15pF, 50V, $\pm 10\%$
C915	DD1650001	Ceramic 50pF, 50V, $\pm 10\%$
C916	DD1650001	Ceramic 50pF, 50V, $\pm 10\%$
C917	DF1747401	Film 0.47 μ F, 50V, $\pm 20\%$
C918	DF1747401	Film 0.47 μ F, 50V, $\pm 20\%$
C919	EA1070509	Electroly 100 μ F, 50V
C922	DD1610101	Ceramic 100pF, 50V, $\pm 10\%$
C923	DD1610101	Ceramic 100pF, 50V, $\pm 10\%$
SEMICONDUCTORS		
H901	HT313271T	Transistor 2SC1327 (T)
H902	HT313271T	Transistor 2SC1327 (T)
H903	HT313271S	Transistor 2SC1327 (S)
H904	HT313271S	Transistor 2SC1327 (S)
H905	HT304580R	Transistor 2SC458LGA (B)
H906	HT304580R	Transistor 2SC458LGA (B)
MISCELLANEOUS		
J901	YP1000091	Plug
J902	YP1000091	Plug
J903	YP1000091	Plug
J904	YP1000091	Plug
J905	YP1000091	Plug
J906	YP1000091	Plug
J907	YP1000091	Plug
J910	YP1000091	Plug
P500	YD2821005 (ZZ2867105)	P.C. Board Pre Amp. P.C. Board Assembly
RESISTORS (All resistors are $\pm 5\%$, 1/4W and carbon type, unless otherwise indicated.)		
R501	RT0510214	1K Ω
R502	RT0510214	1K Ω
R503	RT0582414	820K Ω
R504	RT0582414	820K Ω
R505	RT0527414	270K Ω
R506	RT0527414	270K Ω
R507	RT0556214	5.6K Ω
R508	RT0556214	5.6K Ω
R509	RT0522414	220K Ω
R510	RT0522414	220K Ω
R511	RT0536114	360 Ω
R512	RT0536114	360 Ω
R513	RT0515414	150K Ω
R514	RT0515414	150K Ω
R515	RT0513314	13K Ω
R516	RT0513314	13K Ω
R517	RT0515314	15K Ω
R518	RT0515314	15K Ω
R519	RT0582114	820 Ω
R520	RT0582114	820 Ω
R521	RT0522414	220K Ω
R522	RT0522414	220K Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R523	RT0533214	3.3K
CAPACITORS		
C501	DF1722402	Film 0.22 μ F, \pm 20%
C502	DF1722402	Film 0.22 μ F, \pm 20%
C503	EA4750359	Electroly 4.7 μ F, 35V
C504	EA4750359	Electroly 4.7 μ F, 35V
C505	EE1050501	Electroly 1 μ F, 50V, \pm 20%
C506	EE1050501	Electroly 1 μ F, 50V, \pm 20%
C507	DD1630001	Ceramic 30pF
C508	DD1630001	Ceramic 30pF
C509	EA1070109	Electroly 100 μ F, 10V
C510	EA1070109	Electroly 100 μ F, 10V
C511	EA1060359	Electroly 10 μ F, 35V
C512	EA1060359	Electroly 10 μ F, 35V
C513	EV4740251	Electroly 0.47 μ F, 25V
C514	EV4740251	Electroly 0.47 μ F, 25V
C515	EA1070359	Electroly 100 μ F, 35V
C516	DD1650001	Ceramic 50pF, 50V, \pm 10%
C517	DD1650001	Ceramic 50pF, 50V, \pm 10%
SEMICONDUCTORS		
H501	HT304580Z	Transistor 2SC458LG (D)
H502	HT304580Z	Transistor 2SC458LG (D)
H503	HT304580Y	Transistor 2SC458LG (C)
H504	HT304580Y	Transistor 2SC458LG (C)
H505	HT304580Y	Transistor 2SC458LG (C)
H506	HT304580Y	Transistor 2SC458LG (C)
MISCELLANEOUS		
J501	YP1000091	Plug
J502	YP1000091	Plug
J503	YP1000091	Plug
J504	YP1000091	Plug
J505	YP1000091	Plug
J506	YP1000091	Plug
J507	YP1000091	Plug
J508	YP1000091	Plug
J509	YP1000091	Plug
J510	YP1000091	Plug
J511	YP1000091	Plug
J512	YP1000091	Plug
J513	YP1000091	Plug
J514	YP1000091	Plug
J515	YP1000091	Plug
P600	YD2819001 (ZZ2867101)	P.C. Board Filter, Loudness P.C. Board Assembly
RESISTORS (All resistors are \pm 5%, 1/4W and carbon type, unless otherwise indicated.)		
R601	RT0522414	220K Ω
R602	RT0522414	220K Ω
R603	RT0510514	1M Ω
R604	RT0510514	1M Ω
R607	RT0547214	4.7K Ω
R608	RT0547214	4.7K Ω
R609	RT0522514	2.2M Ω
R610	RT0522514	2.2M Ω
R611	RT0510314	10K Ω
R612	RT0510314	10K Ω
R613	RT0510414	100K Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R614	RT0510414	100K Ω
CAPACITORS		
C601	DF1733301	Film 0.033 μ F, \pm 20%, 50V
C602	DF1733301	Film 0.033 μ F, \pm 20%, 50V
C603	DF1668201	Film 0.0068 μ F, \pm 10%, 50V
C604	DF1668201	Film 0.0068 μ F, \pm 10%, 50V
C605	DF1733301	Film 0.033 μ F, \pm 20%, 50V
C606	DF1733301	Film 0.033 μ F, \pm 20%, 50V
C607	DD1510101	Ceramic 100pF, \pm 5%, 50V
C608	DD1510101	Ceramic 100pF, \pm 5%, 50V
MISCELLANEOUS		
J601	YP1000094	Plug
J602	YP1000094	Plug
J603	YP1000094	Plug
S601	SP0204003	Pushswitch
P650	YD2821006 (ZZ2867106)	P.C. Board Tone Control P.C. Board Assembly
RESISTORS (All resistors are \pm 5%, 1/4W and carbon type, unless otherwise indicated.)		
R651	RT0568214	6.8K Ω
R652	RT0568214	6.8K Ω
R653	RT0512214	1.2K Ω
R654	RT0512214	1.2K Ω
R655	RM0503038	Variable 50K Ω A
R656	RM0503038	Variable 50K Ω A
R657	RT0527214	2.7K Ω
R658	RT0527214	2.7K Ω
R659	RT0522414	220K Ω
R660	RT0522414	220K Ω
CAPACITORS		
C651	DF1756201	Film 0.0056 μ F, \pm 20%, 50V
C652	DF1756201	Film 0.0056 μ F, \pm 20%, 50V
C653	DF1733301	Film 0.033 μ F, \pm 20%, 50V
C654	DF1733301	Film 0.033 μ F, \pm 20%, 50V
C655	DF1733301	Film 0.033 μ F, \pm 20%, 50V
C656	DF1733301	Film 0.033 μ F, \pm 20%, 50V
C657	DF1722402	Film 0.22 μ F, \pm 20%, 50V
C658	DF1722402	Film 0.22 μ F, \pm 20%, 50V
MISCELLANEOUS		
J651	57219520W	Lug Eyelet
J652	57219520W	Lug Eyelet
J653	57219520W	Lug Eyelet
J654	57219520W	Lug Eyelet
J655	57219520W	Lug Eyelet
J656	57219520W	Lug Eyelet
P700	YD2867006 (ZZ2867006)	P.C. Board Main Amp. P.C. Board Assembly
RESISTORS (All resistors are \pm 5%, 1/4W and carbon type, unless otherwise indicated.)		
R701	RT0510214	1K Ω
R702	RT0510214	1K Ω
R703	RT0568414	680K Ω
R704	RT0568414	680K Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
R705	RT0556314	56K Ω	
R706	RT0556314	56K Ω	
R707	RT0524314	24K Ω	
R708	RT0524314	24K Ω	
R709	RT0556214	5.6K Ω	
R710	RT0556214	5.6K Ω	
R711	RT0518114	180 Ω	
R712	RT0518114	180 Ω	
R713	RC1022212	Solid	2.2K Ω $\pm 10\%$, 1/2W
R714	RC1022212	Solid	2.2K Ω $\pm 10\%$, 1/2W
R715	RT0527214	2.7K Ω	
R716	RT0527214	2.7K Ω	
R717	RT0582314	82K Ω	
R718	RT0582314	82K Ω	
R719	RT0512314	12K Ω	
R720	RT0512314	12K Ω	
R721	RC1033212	Solid	3.3K Ω $\pm 10\%$, 1/2W
R722	RC1033212	Solid	3.3K Ω $\pm 10\%$, 1/2W
R723	RA0104012	Trimming	100K Ω (B)
R724	RA0104012	Trimming	100K Ω (B)
R725	RT0510114	100 Ω	
R726	RT0510114	100 Ω	
R727	RT0582214	8.2K Ω	
R728	RT0582214	8.2K Ω	
R729	RA0501005	Trimming	470 Ω (B)
R730	RA0501005	Trimming	470 Ω (B)
R731	GF0539114	Oxide	390 Ω
R732	GF0539114	Oxide	390 Ω
R733	GF0539114	Oxide	390 Ω
R734	GF0539114	Oxide	390 Ω
R735	GF0510014	Oxide	10 Ω
R736	GF0510014	Oxide	10 Ω
R737	GF0522114	Oxide	220 Ω
R738	GF0522114	Oxide	220 Ω
R739	GF0522114	Oxide	220 Ω
R740	GF0522114	Oxide	220 Ω
R741	GF0510214	Oxide	1K Ω
R742	GF0510214	Oxide	1K Ω
R743	GF0522014	Oxide	22 Ω
R744	GF0522014	Oxide	22 Ω
R745	GF0510214	Oxide	1K Ω
R746	GF0510214	Oxide	1K Ω
R747	RW1000503	Wire Wound	0.5 Ω $\pm 10\%$, 3W
R748	RW1000503	Wire Wound	0.5 Ω $\pm 10\%$, 3W
R749	RW1000503	Wire Wound	0.5 Ω $\pm 10\%$, 3W
R750	RW1000503	Wire Wound	0.5 Ω $\pm 10\%$, 3W
R753	RC1010012	Solid	10 Ω $\pm 10\%$, 1/2W
R754	RC1010012	Solid	10 Ω $\pm 10\%$, 1/2W
R755	RT0536314	36K Ω	
R756	RT0536314	36K Ω	
R757	RT0536314	36K Ω	
R758	RT0536314	36K Ω	
CAPACITORS			
C701	EE4740501	Electroly	0.47 μ F, 50V, $\pm 20\%$
C702	EE4740501	Electroly	0.47 μ F, 50V, $\pm 20\%$
C703	EA2270359	Electroly	220 μ F, 35V
C704	EA2270359	Electroly	220 μ F, 35V
C705	DD1650001	Ceramic	50pF, 50V, $\pm 10\%$
C706	DD1650001	Ceramic	50pF, 50V, $\pm 10\%$
C707	EA4760509	Electroly	47 μ F, 50V
C708	EA4760509	Electroly	47 μ F, 50V
C709	EA4760509	Electroly	47 μ F, 50V

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
C710	EA4760509	Electroly	47 μ F, 50V
C711	EA1060359	Electroly	10 μ F, 35V
C712	EA1060359	Electroly	10 μ F, 35V
C713	DD1550050	Ceramic	50pF, $\pm 5\%$
C714	DD1550050	Ceramic	50pF, $\pm 5\%$
C715	EA1070109	Electroly	100 μ F, 10V
C716	EA1070109	Electroly	100 μ F, 10V
C717	EA2260359	Electroly	22 μ F, 35V
C718	EA2260359	Electroly	22 μ F, 35V
C719	DD1650001	Ceramic	50pF, $\pm 10\%$
C720	DD1650001	Ceramic	50pF, $\pm 10\%$
C721	DD1650001	Ceramic	50pF, $\pm 10\%$
C722	DD1650001	Ceramic	50pF, $\pm 10\%$
C723	DK1610150	Ceramic	100pF, $\pm 10\%$
C724	DK1610150	Ceramic	100pF, $\pm 10\%$
C725	DF1710452	Film	0.1 μ F, 200V, $\pm 20\%$
C726	DF1710452	Film	0.1 μ F, 200V, $\pm 20\%$
SEMICONDUCTORS			
H701	HT309452A	Transistor	2SC945 Q, R
H702	HT309452A	Transistor	2SC945 Q, R
H703	HT311751H	Transistor	2SC1175 D
H704	HT311751H	Transistor	2SC1175 D
H705	HT303711B	Transistor	2SC371 O
H706	HT303711B	Transistor	2SC371 O
H707	HT105621B	Transistor	2SA562
H708	HT105621B	Transistor	2SA562
H713	HV0000705	Varistor	S3016R
H714	HV0000705	Varistor	S3016R
H715	HD1000105	Diode	IN60
H716	HD1000105	Diode	IN60
H717	HD1000105	Diode	IN60
H718	HD1000105	Diode	IN60
MISCELLANEOUS			
J701	YP1000091	Plug	
J702	YP1000091	Plug	
J703	YP1000091	Plug	
J704	YP1000091	Plug	
J705	YP1000091	Plug	
J706	YP1000091	Plug	
J707	YP1000091	Plug	
J708	YP1000091	Plug	
J709	YP1000091	Plug	
J710	YP1000091	Plug	
J711	YP1000091	Plug	
J712	YP1000091	Plug	
J713	YP1000091	Plug	
J714	YP1000091	Plug	
J715	YP1000091	Plug	
J716	YP1000091	Plug	
J717	YP1000091	Plug	
J718	YP1000091	Plug	
J719	YP1000091	Plug	
J720	YP1000091	Plug	
J721	YP1000091	Plug	
J722	YP1000091	Plug	
J723	YP1000091	Plug	
J724	YP1000091	Plug	
J725	YP1000091	Plug	
J726	YP1000091	Plug	

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
P800	YD2867005 (ZZ2867005)	P.C. Board	Power Supply
		P.C. Board Assembly	
RESISTORS			
R801	GF0527114	Oxide	270Ω ±5%, 1/4W
R802	GT0527101	Solid	270Ω ±5%, 1W
R803	GT0533101	Solid	330Ω ±5%, 1W
R805	RT0568214	Carbon	6.8KΩ ±5%, 1/4W
R806	RT0533314	Carbon	33KΩ ±5%, 1/4W
CAPACITORS			
C801	DK1810351	Ceramic	0.01μF, 500V, +100% -10%
C802	DK1810351	Ceramic	0.01μF, 500V, +100% -10%
C803	EA3370631	Electrolytic	330μF, 63V
C804	EA4770359	Electrolytic	470μF, 35V
C805	EA4770169	Electrolytic	470μF, 16V
C806	EA4760509	Electrolytic	47μF, 50V
C808	EA4760509	Electrolytic	47μF, 50V
C809	EA1070509	Electrolytic	100μF, 50V
C810	EA4770169	Electrolytic	470μF, 16V
SEMICONDUCTORS			
H802	HT312132A	Transistor	2SC1213 B or C
H804	HD2000413	Diode	SIB-01-02
H805	HD2000413	Diode	SIB-01-02
H806	HD3002209	Diode	BZ-120
H808	HD2000413	Diode	SIB-01-02
MISCELLANEOUS			
J801	YP1000091	Plug	
J802	YP1000091	Plug	
J803	YP1000091	Plug	
J808	YP1000091	Plug	
J809	YP1000091	Plug	
J810	YP1000091	Plug	
J811	YP1000091	Plug	
J812	YP1000091	Plug	
J813	YP1000091	Plug	
J814	YP1000091	Plug	
J815	YP1000091	Plug	
P850	YD2867004 (ZZ2867004)	P.C. Board	Stereo Lamp
		P.C. Board Assembly	
M851	IN10063010	Lamp	6.3V, 0.04A
M852	IN10063010	Lamp	6.3V, 0.04A
J851	YP10000940	Plug	
J852	YP10000940	Plug	
RESISTORS			
R001	RT0547214	Carbon	4.7KΩ ±5%, 1/4W
R002	RT0547214	Carbon	4.7KΩ ±5%, 1/4W
R003	RM0254020	Variable	250KΩ MN
R004	RM0254021	Variable	250KΩ A
R005	RJ1010101	Oxide	100Ω ±10%, 1W
R006	RJ1010101	Oxide	100Ω ±10%, 1W
R007	RC1047012	Solid	47Ω ±10%, 1/2W
R008	RC1047012	Solid	47Ω ±10%, 1/2W
R009	RC1022512	Solid	2.2MΩ ±10%, 1/2W
R010	RT0510214	Carbon	1KΩ ±5%, 1/4W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
R011	RT0510214	Carbon	1KΩ ±5%, 1/4W
R012	RC1056012	Solid	56Ω ±5%, 1/2W
R013	RC1002212	Solid	2.2Ω ±5%, 1/2W
R014	RC1002212	Solid	2.2Ω ±5%, 1/2W
R015	RT0533214	Carbon	3.3KΩ ±5%, 1/4W
CAPACITORS			
C001	EA3360109	Electroly	33μF, 10V
C002	DK1710301	Ceramic	0.01μF, 50V
C003	DK1710301	Ceramic	0.01μF, 50V
C004	EC2280502	Electroly	2200μF, 50V
C005	EC2280502	Electroly	2200μF, 50V
C006	EC4780632	Electroly	4700μF, 63V
C007	DF2722350	Film	0.02μF, 400V, ±20%
C008	DF2722350	Film	0.02μF, 400V, ±20%
C009	DF1747351	Film	0.047μF, 600V, ±20%
COILS AND TRANSFORMERS			
L005	LC1302001	Choke Coil	
L001	LF1120024	Ant. Coil	AM
L002	TS1850202	Power Transformer	
L003	LL2391512	Choke Coil	
L004	LL2391512	Choke Coil	
SEMICONDUCTORS			
H005	HV0000212	Varistor	SV-3A
H006	HV0000212	Varistor	SV-3A
H007	HD2001510	Diode	5B1
MISCELLANEOUS			
J013	YJ0800019	Socket	
J014	YJ0800019	Socket	
J015	YJ0800019	Socket	
M001	IM1104203	DC Meter	Signal (AM, FM)
J016	YJ0800019	Socket	
J017	YJ0800019	Socket	
M005	IN1008007	Lamp	8V, 0.2A
M006	IN1008007	Lamp	8V, 0.2A
M007	IN1008007	Lamp	8V, 0.2A
M008	IN1008007	Lamp	8V, 0.2A
M009	IN1008007	Lamp	8V, 0.2A
M010	IN1008007	Lamp	8V, 0.2A
SEMICONDUCTORS			
S001	SR0704001	Rotary Switch	Function
S002	SP0402003	Pushswitch	Tape Monitor, Mono
S003	SP0402004	Pushswitch	SPK Main, Remote
S004	SP0201010	Pushswitch	Power Supply
G001	BF1040001	Printed Compo.	120Ω +0.1μF
J018	YJ0800019	Socket	
J006	YJ0100065	Jack	Head Phone

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION	
J008	YJ0800012	Socket	Fuse Holder
J020	YL0103011	Terminal	3P
F001	FS1020004	Fuse	2A
W001	YC0240010	AC Cord	
W005	YW2867001	Wire Material	
W006	YX2867001	Wire Material	

TECHNICAL SPECIFICATIONS

AUDIO CIRCUITS:

Rated continuous (RMS) power output per channel, both channels operating simultaneously,	20 Watts at 4 and 8 ohms 12 Watts at 16 ohms
Comparable Total Music Power (IHF)	45 Watts at 8 ohms
High-level hum and noise (ref. 20 Watts at 8 ohms)	-77dB
Phono hum and noise	1.5 μ V equivalent input
Dynamic range (phono input to tape recording output)	96dB
I.M. Distortion(SMPTE), at rated power	0.9%
Distortion decreases as output is lowered	
Total Harmonic Distortion, at rated power	0.9% Maximum
Distortion decreases as output is lowered	
Power Bandwidth (IHF) for 0.9% THD	10 Hz to 50,000 Hz
Damping Factor (ref. 8 ohms)	Greater than 45
Frequency Response	
Through phono	1.0dB
Input Sensitivity (for 15 Watts at 8 ohms)	
High-level	180 mV
Phono (1,000 Hz)	1.8mV
Input Impedance	
High-level	100,000 ohms
Phono	47,000 ohms
Channel Separation 20 Hz to 20,000 Hz	35 dB Minimum

FM SECTIONS:

IHF Usable Sensitivity	3.0 μ V
Selectivity	50 dB
Noise Quieting	-60 dB at 1.000 μ V
Total Harmonic Distortion, 400 Hz, 100% Mod	0.4% Maximum
Frequency Response (ref. 75 μ sec. de-emphasis)	\pm 1dB 50 Hz to 15KHz
Stereo Separation	1,000 Hz 40 dB
Sub Carrier (38 KHz) Suppression	60 dB

GENERAL:

Power Requirements	120V AC 50 to 60 Hz
At rated output, both channels operating.	140 Watts
Idling Power (Volume Control at zero).	22.5 Watts
Dimensions	
Panel Width	17 ²¹ / ₆₄ Inches
Panel Height	5 ²⁵ / ₆₄ Inches
Depth	14 Inches
Weight	
Unit alone	26.4 lbs
Packed for shipment	33 lbs

* These specifications and exterior designs may be changed for improvement without advance notice.



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